VOLUME 35 DECEMBER 1942 NUMBER 12

Southern Medical Journal

Journal of the Southern Medical Association

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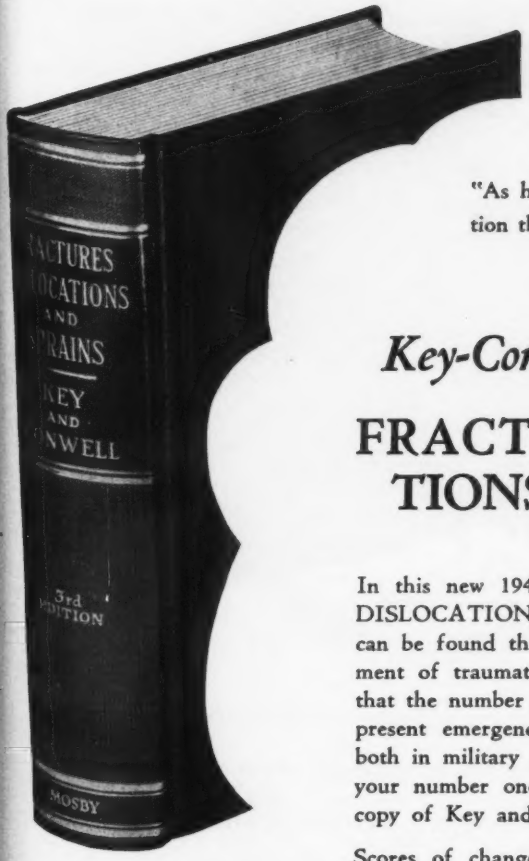

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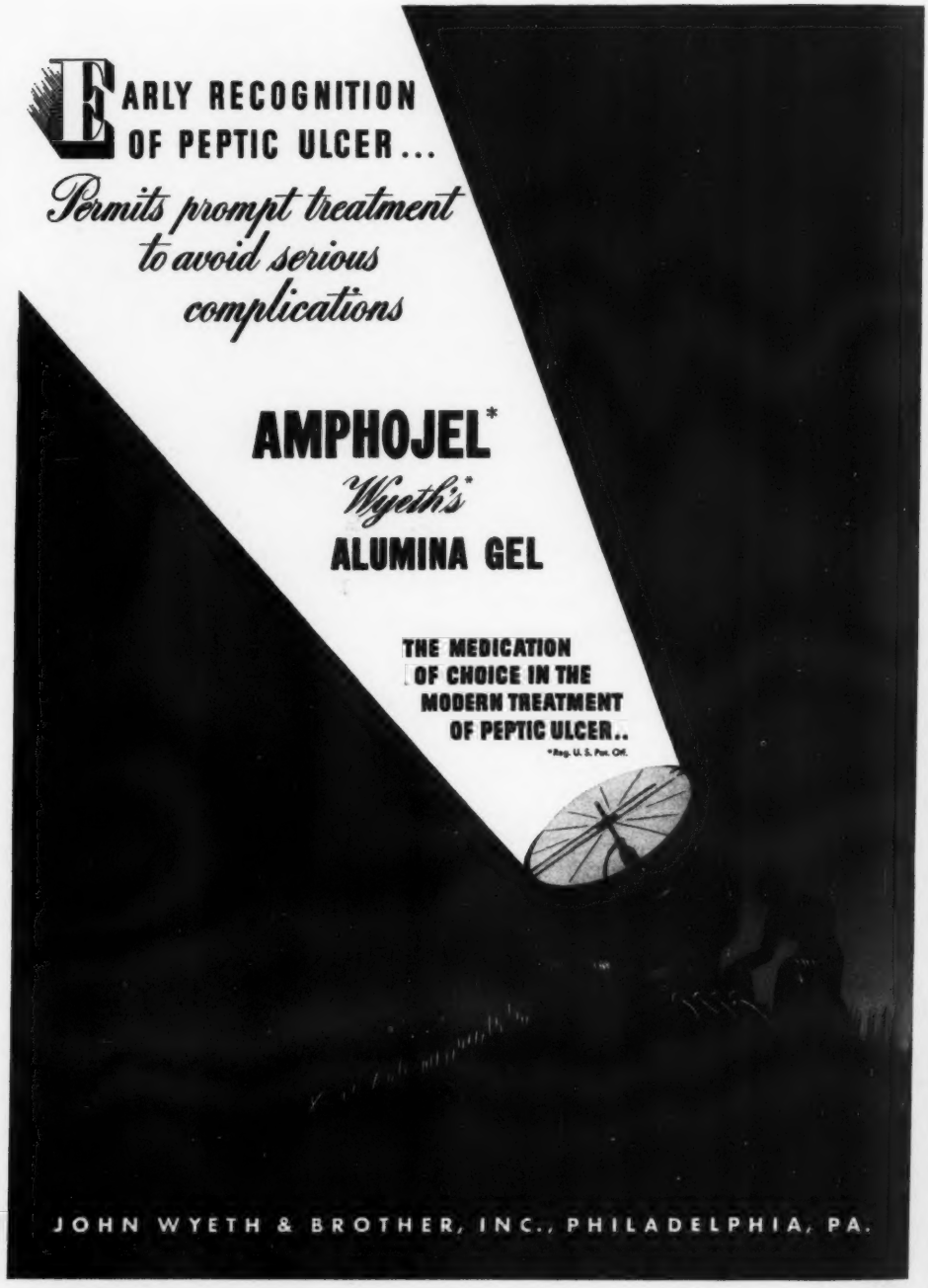
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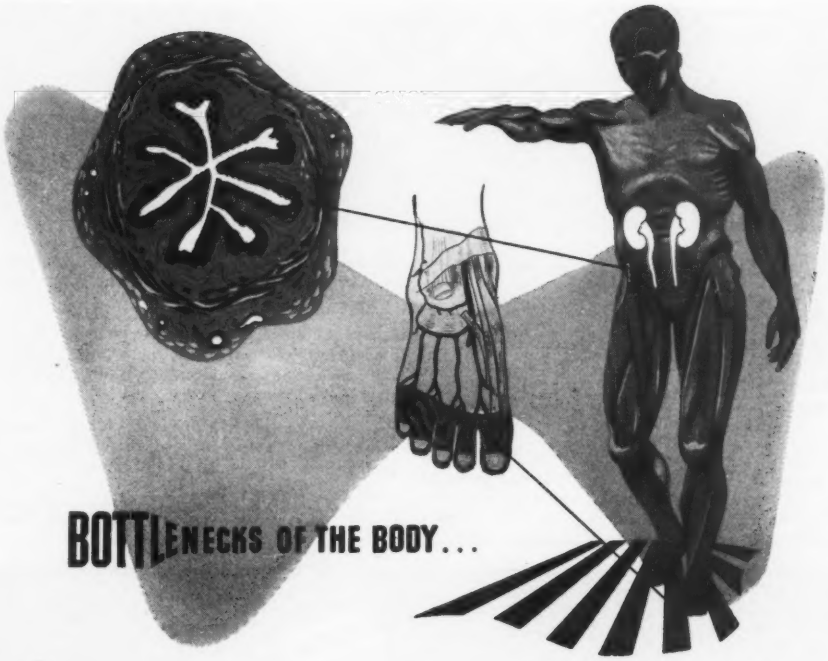

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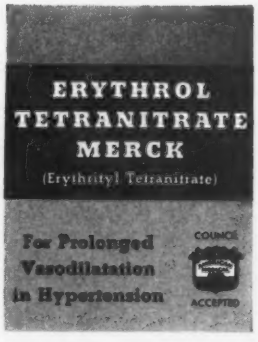

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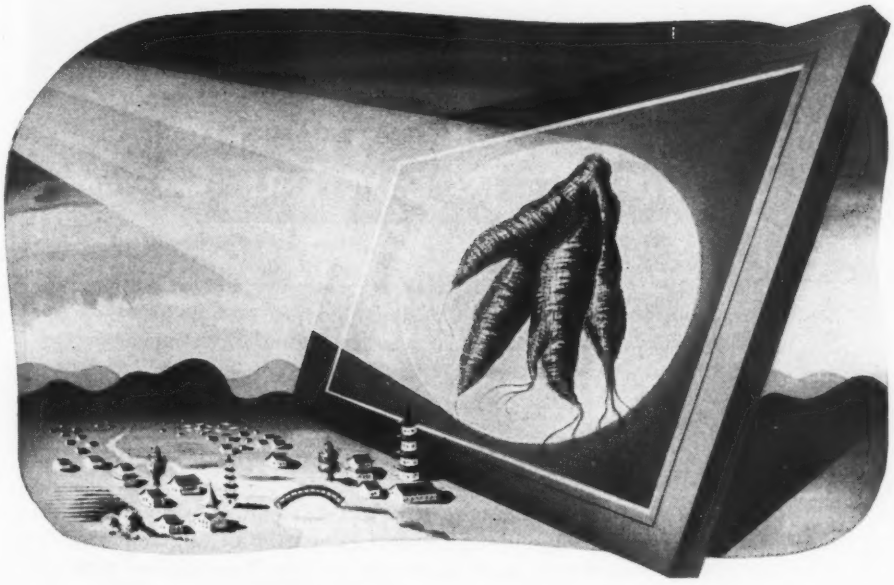

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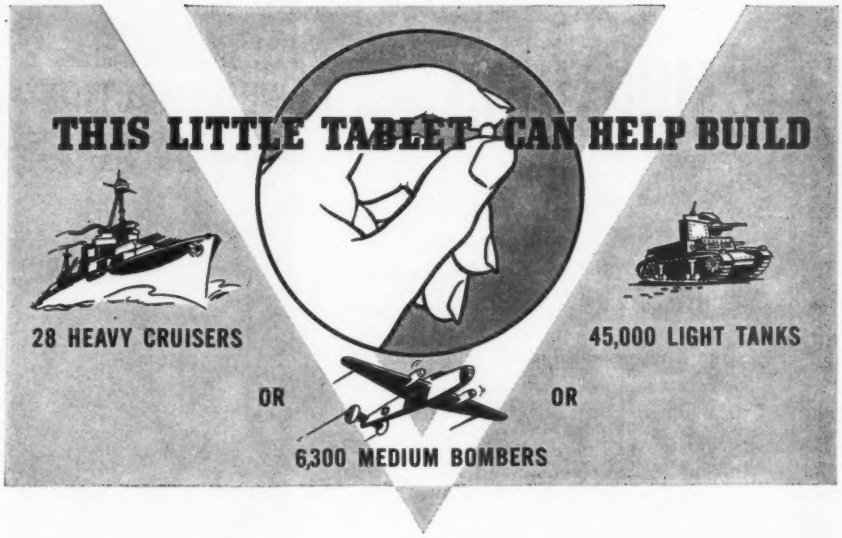

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[2]Solandt, D. Y., and Best, C. H.: Lancet 2: 130 (July 16) 1938.

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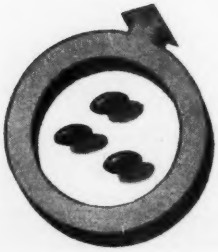

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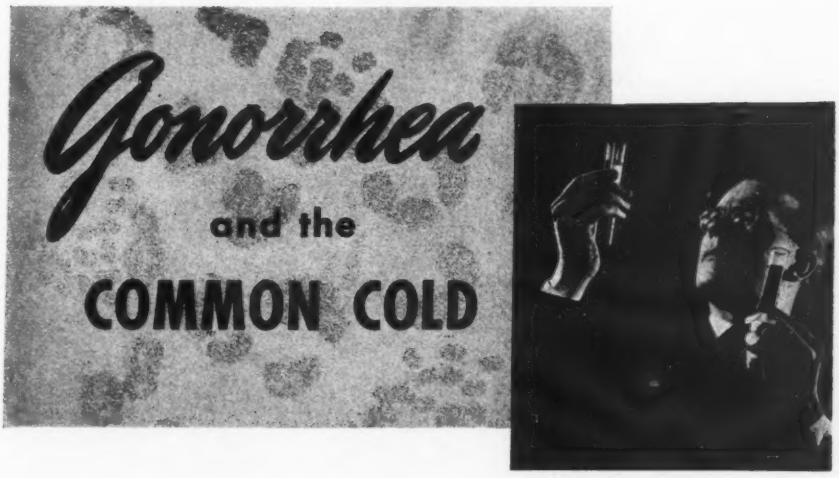

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* *Venereal Dis. Inform.* 23:88 (1942).

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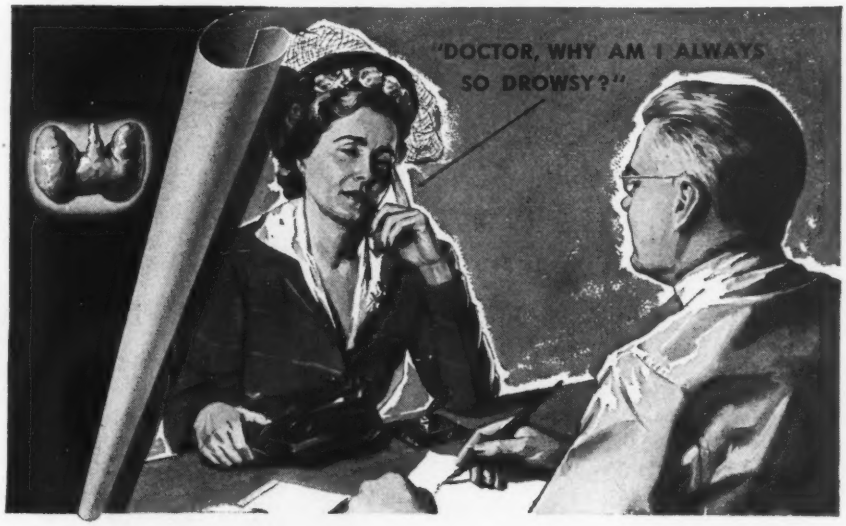

WARFIELD (1) has observed that the undue sense of fatigue and feeling of physical exhaustion, of which many patients complain, is often due to an underlying mild grade of hypothyroidism—and these cases respond admirably to moderate thyroid therapy. The basal metabolism test and blood cholesterol may afford confirmatory evidence of a hypothyroid state.

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(1) *Warfield, L. M.: J. A. M. A.; Oct. 11, 1930; p. 1076*

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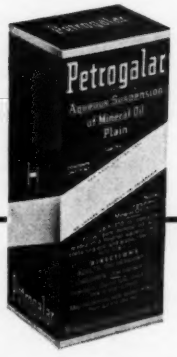

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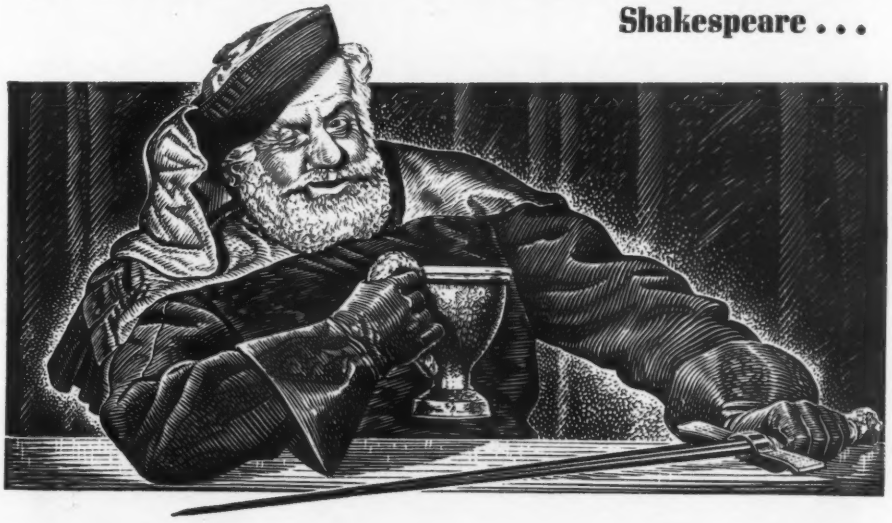

Only in the past few years has the idea been advanced that men, too, experience a climacteric. As with women, the onset cannot always be detected; the symptoms are manifold. The subtler nuances evidencing lack of androgenic hormone are often disregarded or misinterpreted by both physician and patient.

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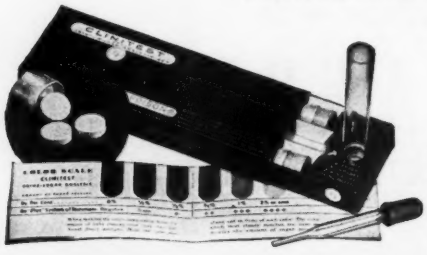

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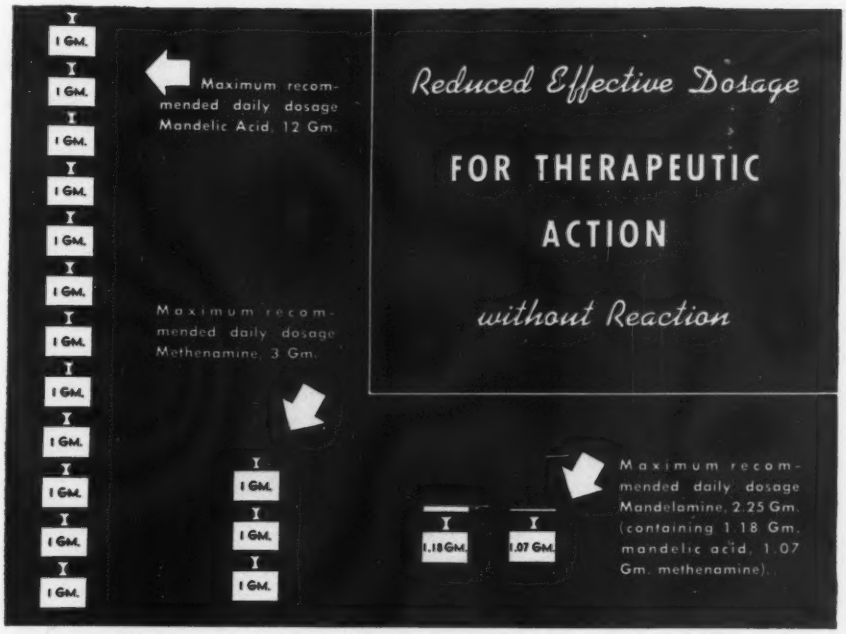
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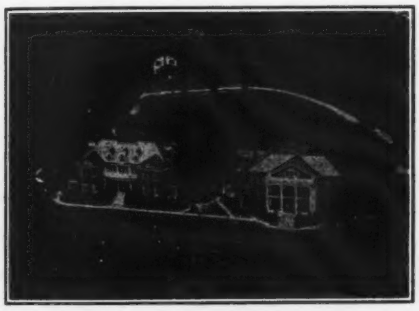

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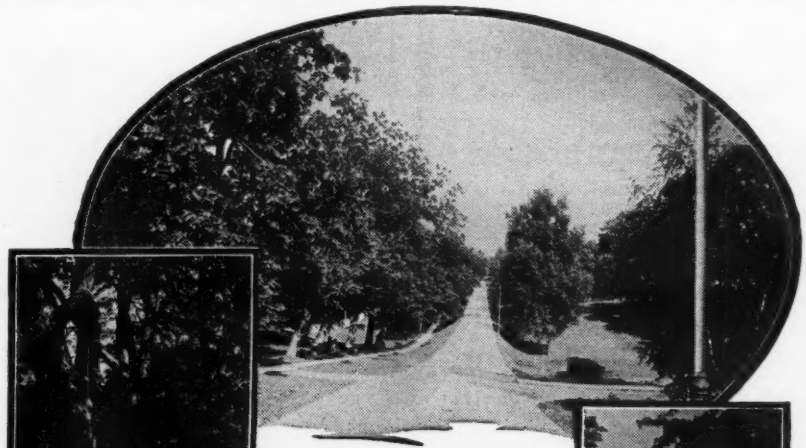

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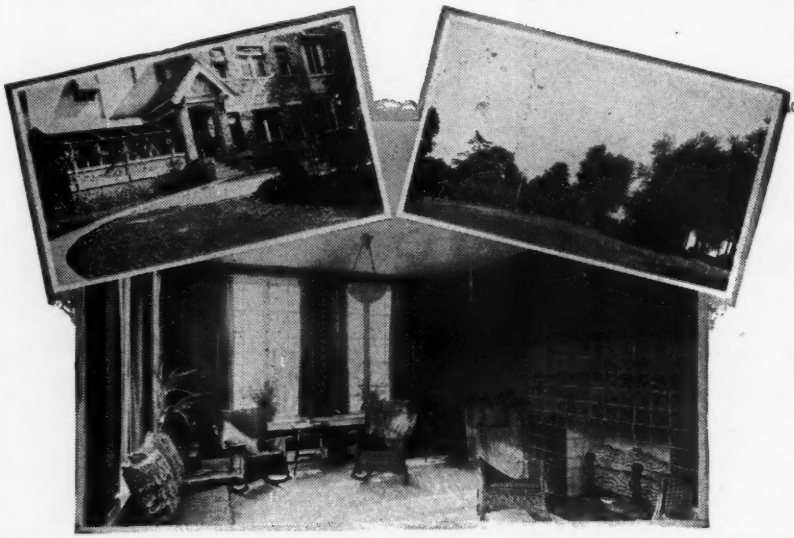

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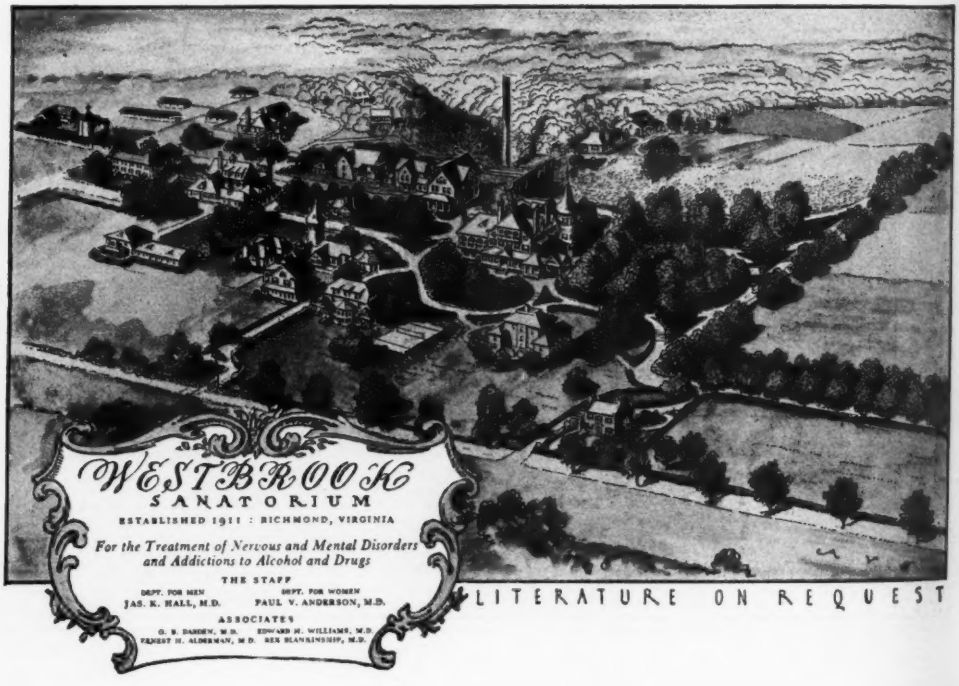

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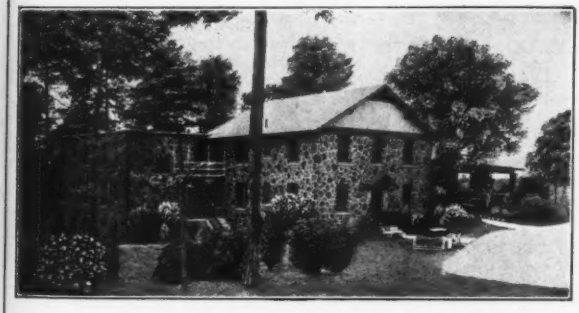

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JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY BY THE SOUTHERN MEDICAL ASSOCIATION AT BIRMINGHAM, ALA.

Volume 35 DECEMBER 1942 Number 12

THE UNKNOWN MAN IN MEDICINE*

By M. PINSON NEAL, M.D.†
Columbia, Missouri

The floating body of a man is removed from a river. The coroner must know if he entered the water dead or alive, and whether death was by drowning or other means. A woman of forty-five years of age presents herself with a painless lump in her breast and is uneasy over the possibility of cancer. There is general alarm over the question of rabies when several children on a public playground are bitten by a stray dog that is seen in convulsive seizures a few hours later. From a crowded troop train a soldier is removed complaining of terrific headache, nausea, and vomiting, and shows retraction of the head prior to his death two days later. Each of the briefly cited cases presents rather pointed features, yet the general practitioner of medicine or the consultant clinician does not make an absolute and final diagnosis. "The doctor behind the scenes," "the silent partner," "the anonymous doctor," "the unknown man in medicine" makes the decisions in these and many other such cases and renders the verdict.

To some, these remarks will be comparable to the often misquoted phrase, "To gild the lily." These will be pathologists or those who know of and use their special knowledge. To most people the title means merely another physician, and one little heard of or from. It is unfortunate that this specialty finds itself little known beyond those who live and work in medicine. How can this condition exist! It is because the pathologist, generally a poor salesman of himself, does not have patients in his own name, commonly is content with his lot if only he is left alone with his problems and is permitted to see his findings applied. Even the medical world knows little or often nothing of those who are not teachers or writers. Of these Oliver Wendell Holmes might have written:

> "A few can touch the magic string,
> And noisy Fame is proud to win them:
> Alas for those that never sing,
> But die with all their music in them!"

The anonymous doctor rarely makes the headlines, and to use football language, he, like the linesmen, diagnoses the opposing team's weakness, blocks, and makes holes for others to go through and reach pay dirt, the scoring grounds. The backfield men pass or carry the ball, thrill the public, and make the news. Yet what a rich inheritance to be a pathologist in these United States of America! For over one hundred years among the resplendent figures in medicine, pathology, in the sense of morbid anatomy, has held a lion's share. Among these may be numbered Rokitansky, Virchow, Orth, Prudden, Welch, Aschoff, Zeit, Hektoen, Wells, MacCallum, Ewing, and Broders. Among the great pathologists who have given their talents to other fields may be mentioned Hodgkins, Laennec, Addison, Osler, Gross, Fenger, and Halsted.

PATHOLOGY: SCIENCE AND ART

That science which deals with the cause, development, manifestations, progress and results of disease, is not a branch of medicine; it is the basis of medicine. It is the capstone of the structure resting upon anatomy and physiology as pillars, and the three constitute the foundation upon which all medicine, surgery, and the specialties are built. One of the most important aspects of pathology is its universality of service and importance to all life, for there are also dental, animal, and plant pathologists. Every doctor of medicine, veterinary medicine and dentistry, is a pathologist in degree, and their every interpretation of disease is based upon this subject. Today there are approximately 1,150 possible diagnoses to be made by laboratory examination on material from a sick in-

*President's Address, Southern Medical Association, Thirty-Sixth Annual Meeting, Richmond, Virginia, November 10-12, 1942.

†Professor of Pathology, University of Missouri School of Medicine.

dividual. This alone causes one to marvel at the very complexities of the pathologist's duties.

This specialty was not born full-fledged. From year to year new methods, procedures, interpretations, technics, yes, even new diseases, have caused it to demonstrate added interest and assume other responsibilities. Medical progress depends upon its being alert and active. Through and because of it, much of the chaos of medicine as a science has disappeared, and medicine as an art has made its greatest stride. To the pathologist the future practitioners; medical students, interns, and residents, look for a large and important part of their training. The general practitioner, internist, surgeon, and specialist go to him for tissue diagnosis, various laboratory tests, and their interpretations, and the coroner for necropsy service and medicolegal aid. The inspection of meats and meat products in the packing industries of the world is a major problem of veterinary pathology. Through packing house inspection and postmortem examination of animals many diseases are not only recognized, but as a result of the findings, preventive and curative measures can often with certainty be applied to surviving animals, and even to man.

Pathology has no natural frontiers. Its borders are nebulous and ever-changing, and wherever a new field of work is touched, occurs a neutral and natural infiltration. Physiologic pathology is an integral part because structural changes are of most importance when viewed in terms of function. This science therefore is not alone morbid anatomy. Few realize that all interpretations of experiments on animals are dependent upon pathologic changes measurable by chemical, structural, or functional alterations.

In this field unfortunately the establishment of research institutes and diagnostic laboratories in addition to university and hospital departments, theoretically, and too often in practice makes for three classes; the research worker or experimental pathologist, the applied, or so-called clinical pathologist, and the teacher. There can be no division or separation of the three fields without detriment to the science involved and the personnel working therein. The pathologist, in football parlance, must be a triple-threat man. Diagnosis and research should not be divorced. To the contrary, they should be more closely supplemental, for research problems commonly arise from routine studies. Pathology stretches so far from the teaching department, the postmortem room, the experimental institute, and the sickroom, to the departments of anatomy, biochemistry, medical bacteriology, immunology, parasitology, roentgenology, and clinical medicine and surgery, that it might be termed "the medical integrator."

Medicine today needs not so much the present type of research conducted away from patients, but instead physiologic and pathologic interpretations correlated with clinical facts and findings, derived from the sufferer. Medicine's chief concern should always be the, and a, living patient. To Osler's statement, "A medical school should revolve around the department of pathology," should be added, "So should a hospital, a clinic—and the practice of medicine."

THE PATHOLOGIST

One finds this group of anonymous doctors imbued with devotion to service. This is, after all, their reason for existence, should be the chief objective of their policies, and the standard by which their worth as physicians is to be evaluated. Their work and responsibilities are held with affection — at times with a fervor amounting almost to jealousy. Too many of them wear out. Their dead bodies bear evidence of overwork rather than overindulgence.

The competent pathologist is an artisan as well as a scientist. As a physician, his duties, too, center upon the prevention and alleviation of suffering and disease. He has no anatomical limitation, knows all tissues and their diseases, and should be the most versatile of all medical men, for he is in need by all departments and specialties. Training, personality, achievement, promise, and ability to do team work and assume leadership are his prerequisites.

In addition to his medical qualifications, the pathologist must be as diplomatic as the cleverist ambassador at a foreign court, and as free from prejudice and foregone conclusions as the Chief Justice of the United States Supreme Court. This silent partner is the doctor's doctor. He performs his duties on another's patient, and reports his findings or interpretations to physicians only. His problem is to study deviations of function and structure by many methods to ascertain what, if indeed anything, is wrong with the individual. Recognition of disease at the autopsy table often enables the institution of preventive measures to others at a time when benefit can be expected, as in rabies, typhoid fever, epidemic meningitis, anthrax, and diphtheria. Some of these are always fatal if one waits until diagnostic symptoms and signs develop, and yet are preventable if proper measures are applied in time.

Most often the medical man between the plow handles and pulling the rope across the mule's back is the pathologist, while his colleagues in other specialties gaze at the rainbow, looking for the pot of gold, fame, recognition, and social standing. These pathologists are hard to get for theirs are hard jobs. While some feel these jobs are the ones worth looking for, few indeed seek them. With hands and clothing colored by tissue and bacterial stains, these men are at home amid the smells of chemical agents, the stillness of the autopsy room, and the tinkling of laboratory glassware.

The unknown man in medicine was trained not to be served, but to serve; not to be ministered unto, but to minister, and such fame as he acquires he gains by hard work. The pathologist-physician thinks, functions, and works in medicine as truly as any man. He is not to be confused with the laboratory technician who is a performer of tests or carries out procedures, and a most valuable aid to the pathologist, though not trained, qualified, or permitted to express interpretive opinion, meet in consultation, prescribe therapy, or accept responsibility for life.

THE TEACHING PATHOLOGIST

Progress in medicine and the development of pathology as a discipline in medical education have been hand-maidens. The former has been largely dependent upon and guided by the latter. One need only compare medicine of as late as 1900 with that of today to appreciate the importance of the changes that have come during the era of pathology.

The teacher of this subject should speak in unmistakable terms, be a strict disciplinarian, and an exponent of visual education. He sees, handles, studies, and describes tissues and organs more than signs, symptoms, and history, possesses a vivid imagination, and has an ability to coin terms and use impressive adjectives. A simple simile, as the term "strawberry gall bladder" often labels and fixes some feature of the lesion or disease much more definitely, though less scientifically and far less elegantly, than a Latin or Greek root word.

The pathologist's creation, the clinico-pathologic conference, is the commonest of all medical meetings and the source of much of the best medical teaching. Here facts are related as facts, and the chips allowed to fall where they belong.

THE EXPERIMENTAL PATHOLOGIST

In this field is the man who knows truth in science is found by trial or experimentation. He likes to ask questions and supply his own answers, and is gifted with patience as well as honesty, integrity, training, and interest. Because of his studies of human and lower animal lesions he may well be termed "the interpreter of comparative pathology." The responses under experiment of living tissue to various causative factors serve in a large measure to give the summed up knowledge possessed by men of medicine.

A source of medical pride is derived from the fact that every worthwhile discovery ever made and remembered, and every accurate observation passed on by preceding physicians and students of disease throughout the ages, are used today in scientific medicine. Because each succeeding period begins and builds upon the shoulders of previous ones, records of observations become priceless. Endless research in making this a healthier world and in giving a stronger race of greatly extended longevity has led to other and immeasurable benefits far beyond the immediate province of medicine.

THE PRACTICING PATHOLOGIST

Most of the duties of a practicing pathologist, likely to be known as a hospital or clinical pathologist, should be related to living patients. The unknown man in medicine forty years ago saw the patient who had lived, saw him after others had failed, as a body upon which his problem was to determine the cause of death. We would have him today see a human being, an individual if you please, who is living and has hopes of life.

It is commonly said in diagnosis that the laboratory man has the last word. This is not always true, but his direct access to diseased tissues or material makes it possible. This gives reason for his never-ending cry, "Take nothing for granted when you can know; look, see, remove, and have it examined by such laboratory procedure as is indicated." His report of positive findings in diagnosis should be final, and he the court of last appeal. Like all other physicians, he must be true to his trust, and his best always available.

To a sick individual and the physician behind the scenes, there is no "little thing." Lesions are all important and measurable in degree. Some definitely are of more significance than others, but one must recognize and weigh them

individually and collectively. The successful practicing and practical pathologist is the one who gives the highest degree of skill in consultation and whose efforts yield the greatest results to the man who is ill. One of the problems and responsibilities of the hospital pathologist is the coordination of the various disciplines of his subject with the several fields of medical practice. He should be endowed with the group mind and think in terms of the several consultants.

Indisputable recognition of the place the hospital pathologist holds and of the need for his services exists in the standards demanded of an "acceptable hospital" and further in the demands required in the training of the intern and resident staff. A hospital cannot offer a complete medical service without a competent pathologist to take his part in teaching, offer stimulus, and maintain a certain degree of supervision over the staff members. The requirements of this man are high. Aside from his general medical training, including a year of internship, he must have rendered specialized service in pathology under supervision for a period of four years, and have passed a rigid examination by the American Board of Pathology for certification before assuming the full responsibilities of this recognized specialty. This program is supported by every conscientious worker in the field of pathology for a good laboratory service is a must in modern medicine. The American Board of Pathology has awarded certificates of qualification to only 879 pathologists,[1] and there are 6,358[2] registered hospitals for that number to serve.

The hospital pathologist instructs interns, residents, and associates on the need, interpretation, and application of many fundamental tests in diagnosis and prognosis. They must be taught the value of the tests in their true perspective and not to depend upon them to the exclusion of history, physical findings and reflection. Orders for laboratory work should be given when—and only when—there is indication for their specific need. Negative findings do not constitute a diagnosis, but call for repetition if the manifestations persist. In the laboratory, trained people labor, material and time are used, and must be paid for.

Like all things with which man deals, medicine centuries ago found that there must be some control over its members and some protection to the public against meddlesomeness, unnecessary acts, and operations. The brakes of today toward that end are:

The Hippocratic Oath;

The codes of ethics of the American Medical Association, the American College of Surgeons, and the various specialty boards;

Personal control or response to the common dictates of humanity and the usual social amenities; and

The hospital pathologist.

AUTOPSY PATHOLOGY

It is of interest to note that among other Virginia priorities the first recorded American autopsy was performed at Jamestown in 1624.[3] The autopsy is a duty to humanity, for from the knowledge thus gained medicine makes progress and future physicians receive training. The dead serve the living, for from them the pathologist obtains information that aids in keeping the living alive.

In medicolegal investigations concerning death, the autopsy surgeon often is the important figure. Here, two questions always arise: what, and who caused the death? The answer to the first is a medical one only, and the second is the subject for legal investigation.

The autopsy pathologist, often referred to as the "lordly ruler of the postmortem room," and known as the one who has the last look and the last word, handles tissues and organs of a dead body. The corpse which he has for a patient and over which he toils is there because the life which it represented could not overcome some disease. The pathologist is exposed to the full elements of that disease and the causative agents that have already taken a life. He is in danger, danger of the same disease and death that gave him the patient.

PLEA TO PRACTICING PHYSICIANS

The unknown man in medicine would like to have practicing physicians take personal stock on the following:

Are you getting from your laboratory the help you would like and to which you and your patients are entitled?

Is the laboratory practitioner utilized as a consultant, and treated as a colleague in medicine?

When he is called upon for consultation, to examine a patient or a specimen, and render a verdict, and that is accomplished, is he asked into later conferences and informed of the ultimate outcome of the case?

Limitation of the pathologist exists. Some

of these could be removed through intelligent treatment by the clinician. Reciprocity of information between clinician and this "silent partner" is essential to optimal results. Patients receive the best medical care when doctors work together, general practitioner, specialist, and consultant, each helping the other as coals of fire warm each other. The surgeon whose patient can best be served is the one who has a pathologist at his elbow in the operating room, ready to inspect tissues exposed through the operative field, and thus is in position to render competent, complete, and intelligent opinion. To become a better physician and teacher and a more delving research worker, this specialist must see patients. His call should not be to pull the "burning chestnuts out of the fire," perform an autopsy on some obscure or difficult case, render an explanation, and then disappear from the scene. Judgment, skill, and experience result only as one encounters with reasonable frequency the various diseases, their manifestations, and results. Only too rarely does the laboratory man know the fate of the patient upon whom he renders opinion. This prevents the development of a true sense of diagnosis and prognosis builded on experience. Future consultants, colleagues, students, and the public are thereby deprived of that acquisition of knowledge important in the practice of medicine.

The unknown doctors need time for investigational work, opportunity to teach, contact with and study of clinical cases, and remuneration commensurate with ability. They should be on secure financial footing; that is, on a level with other medical specialists holding equal training and responsibility. If this is not forthcoming medicine and humanity will suffer. Young men of promise will not be attracted to any specialty when more lucrative incomes are to be had in other fields that demand less training and far less effort.

From these comments one may be in doubt as to whether the unknown man in medicine is a tradesman, a craftsman, an artist, or a scientist. The one worthy of the name combines in liberal measure a love of humanity, service, science, and craft. However one may choose to interpret the activities of a pathologist, it has been an honor and a privilege to discuss the interests of that individual and for one of that number to have served as your President this year. Why he was honored with this consideration is for you to answer. He certainly was not called because of obscure disease, gravity, corruption, threat of deterioration, or death to this Association. It is in excellent health, staffed by those who unstintingly give of their interest, energy, patience, and enthusiasm, and its house is in good order.

To the members of the Association, thanks are extended for the honors and privileges that have been mine as your President, and to the Council, general officers, and headquarters staff, appreciation for their many courtesies and considerations.

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ACUTE HEMATOGENOUS INTERSTITIAL NEPHRITIS*

By W. R. MATHEWS, M.D.
Shreveport, Louisiana

Acute hematogenous interstitial nephritis is vaguely characterized clinically and can be called barely more than a morphologic concept anatomically. The clinical view prevails that the condition is more of an anatomic than a clinical entity, associated with severe sepsis or diphtheria, and that it constitutes a postmortem finding without known clinical significance.[1] A current textbook[2] on pathology summarily dismisses the subject as a complication of infectious fevers, producing no significant alterations in renal function. While this view may be correct as pertains to a causal relationship between the morphologic changes and disturbance of function, it totally ignores the infrequent case of anuric uremia which shows structural changes characteristic of acute interstitial nephritis. Such complacency regarding this condition, moreover, has not been universal, and several observers have recognized fatalities from renal insufficiency associated with this lesion.

Kaufman,[3] in discussing acute nephritis complicating scarlatina, says that multiple focal disease of the renal interstitium need not produce severe symptoms because of its focal character, but if the parenchyma is more severely involved it may cause death from uremia. According to

*Chairman's Address, Section on Pathology, Southern Medical Association, Thirty-Sixth Annual Meeting, Richmond, Virginia, November 10-12, 1942.

Bell,[4] albuminuria is usually the only evidence of renal injury, but in rare severe cases there is oliguria, nitrogen retention and uremia. Muir[5] recognizes fatalities from this cause, and describes the essential renal structural change as an infiltration of the connective tissue by non-granular leukocytes, though eosinophils and neutrophils may be present. Kimmelstiel[6] observed six cases of acute interstitial nephritis with "more or less isothenuric oliguria or anuria and a rise in the nonprotein nitrogen," although he failed to find basis for a causal relationship between the morphology and functional disturbance. He also included in this study 12 additional instances of the disease that were encountered incidentally at autopsy.

The lack of a satisfactory explanation of the pathogenesis of renal failure in the fatal cases has contributed in part, at least, to the varied opinion which has developed regarding the importance of this lesion. It was logical to suspect a causal relationship between the renal structural changes and the functional disturbance, and compression of the tubules and blood vessels has been regarded as a reasonable explanation. This mechanism appears to be supported by the fact that restoration of function has been observed to follow decapsulation,[6] although in such instances it is not really known whether this results from reduction of intracapsular pressure, or whether the procedure may be effective in some other manner. In most fatalities from this cause the kidneys are greatly swollen, but instances in which these organs show little or no enlargement are not uncommon. Also the incidental autopsy finding of swollen kidneys showing this lesion unassociated with impressive clinical features of altered renal function is not easily reconciled to the pressure theory. Some degree of dilatation of the tubules and capsular spaces is usually present, but this manifestation is frequently not marked and may be absent. It would be logical to expect consistency in the prevalence of this change provided compression of the tubular apparatus represents the mode of failure.

From an analysis of the structural changes one would not necessarily expect to establish or exclude all possible grades of pressure effect on the blood vessels. It is not difficult to hypothecate distributions and localizations of the exudate that might exert a local effect apart from the generalized effect resulting from increased intracapsular pressure. The tendency for the cellular infiltration to extend along the interlobular vessels is perhaps, in this respect, less of a menace than collection of cells around the afferent arterioles, which has been noted.[5] It is admitted, however, that distributions of the exudate in relation to vessels in such a manner as strongly to suggest this mechanism has not been observed in cases personally studied.

As late as 1937, Bell[7] cited a uremic death in scarlet fever in which he attributed renal insufficiency to compression of the tubules and blood vessels by massive cellular infiltration of the interstitial tissue. In the same study he recorded an instance of acute lymphatic leukemia in a 40-year-old woman, whose blood urea nitrogen reached 105.4 mg. per cent and whose creatinine was 7.5 mg. per cent. The kidneys weighed 370 grams and showed widespread leukemic infiltration of the cortex. It was his view that the mechanism of renal failure here was similar to that in acute interstitial nephritis.

Leukemic infiltration of the kidneys with respect to cellular infiltration of the interstitial tissue is a morphologic equivalent of acute interstitial nephritis, and would therefore be expected to produce renal insufficiency not too rarely provided the mechanism of failure resides in pressure on the tubules and blood vessels. Yet, so far as I know, uremia developing on this basis in the course of leukemia is practically unknown. In a review of the clinical records of 33 autopsied cases of leukemia, among which several examples of massive infiltration of the kidneys were present (combined weight as much as 1050 grams), I failed to find mention of more than albuminuria as evidence of abnormal renal function. It should be added, however, that the complication was not anticipated and that no special attention was directed towards its detection.

The view has been expressed that acute interstitial nephritis due to infectious states,[8] especially hemolytic streptococcic infections,[9] develops on the basis of an antigen-antibody mechanism. Kimmelstiel[6] has extended this concept to include interstitial nephritis occurring in conditions that results from hemolytic reactions and aseptic liver necrosis. He regards the renal lesion as well as similar lesions that may be present in other organs as a hallmark of hyperergy, of which renal insufficiency may be a functional manifestation. From his point of view, the renal lesion is coincident rather than causatively related to oliguria or anuria; and the common denominator for all conditions in which interstitial nephritis occurs is a foreign protein or split protein product, the effect of which depends upon its nature and the state of reaction of the

body cells. Thus interstitial nephritis and anuria would not necessarily be expected to be present simultaneously, though their frequent occurrence together would occasion no surprise.

From the standpoint of bridging a number of gaps in our knowledge of interstitial nephritis the conception of a hyperergic reaction is an inviting one.

In the first place, the wide variety of disease states in which this condition may be encountered connotes a nonspecific character of the lesion and suggests the prevalence of a mechanism broadly adapted to react to antigenic substances which have in common, perhaps, only a protein nature. The lesion has been found in scarlet fever, sepsis, diphtheria, Weil's disease, yellow fever, hepatic abscess, aseptic liver necrosis, hemoglobinuria and other infectious diseases.

Secondly, interstitial nephritis due to Streptococcus hemolyticus does not occur early in the course of the infection, but there is a latent period of about 10 days which parallels quite closely the time when antibody formation is demonstrable in the patient. From the standpoint of a hyperergic reaction this is precisely the sequence that would be expected. This hypothesis may be further supported by information obtained from a somewhat different approach. It is known that early in the course of scarlet fever the nucleoprotein fraction of the streptococcus produces little or no reaction in the skin. As the disease progresses and the patient recovers the skin reaction to nucleoprotein becomes strongly positive. This is a hypersensitive reaction in the skin of the delayed type, which shows the same histologic characteristics as the lesions of interstitial nephritis. [9] [10]

There is reason to doubt, however, that no inflammatory reaction exists in the kidneys prior to the time of development of the lesion characteristic of the hyperergic reaction. In rare cases of acute hemolytic streptococcic infection dying early in the course of illness (12 hours, 3 days and 6 days), organisms alone, organisms plus an acute suppurative process or an acute suppurative process alone was observed by Mallory and Keefer.[9] The lesions had the same distribution and localization as the more commonly observed, bacteria-free focal cellular accumulations which occurred predominantly after the tenth day. The distribution of the early suppurative and latent non-suppurative lesions to precisely the same areas was considered suggestive evidence that they resulted from the presence of bacterial antigen.

And lastly, the frequent association of shock or shock-like states with the onset of anuria which may terminate fairly promptly under conditions resembling shock, or may progress for days to a uremic state, even with restoration of the blood pressure to an adequate level, would appear to support the theory of an antigen-antibody reaction. It seems fairly obvious that renal function itself need not come under suspicion in instances of acute anuria associated with persistent shock in such conditions as burns, liver injury and transfusion reactions. Circulatory failure due to an inadequate circulating blood volume furnishes a satisfactory explanation. However, in those instances in which the anuria persists in spite of a normal or elevated blood pressure such an explanation is untenable. Renal arterial spasm has been proposed as a likely possibility, a theory which is apparently supported by experimental studies on dogs. In these animals, it has been observed that a decrease in kidney volume follows transfusion unless these organs are previously denervated.[11] In this connection, however, it may be noted that spinal anesthesia had no influence on oliguria following a transfusion reaction in a human case studied by Bell.[7] The validity of the theory may be further challenged on the basis of the structural changes in the glomeruli. Among other causes, prolonged spasm of the renal arterioles is known to be capable of producing swelling of the glomerular capillary basement membranes. In most studies on this subject special reference to the basement membranes is lacking, but the absence of thickening has been specifically noted in a sufficient number of cases to suggest that this is not a characteristic morphologic manifestation in the "transfusion kidney."[12]

The theory that renal insufficiency complicating hemolytic processes, such as transfusion reaction, hemolysis due to drugs and black water fever, is due to structural damage of the kidney may be challenged from a number of sources. A widely accepted explanation is that in the presence of an acid urine, some of the hemoglobin liberated in the blood is precipitated in the form of acid hematin granules which, when concentrated by reabsorption of water, produces mechanical blockage of the tubules with ensuing anuria and uremia.[13] According to this view, the central factor in suppression is the acid urine. The high esteem in which this explanation is held in clinical medicine is attested by the practice of giving alkalies to prevent or alleviate anuria in the presence of hemoglobinuria, or to prevent it in anticipated attacks. This continues

to form a rational therapeutic approach, notwithstanding that a proportion of hemoglobinuric cases developing anuria do so in the presence of an alkaline urine. In paroxysmal hemoglobinuria large quantities of hemoglobin may be excreted without apparent damage to the kidneys. In an induced attack of hemoglobinuria in a patient afflicted with this disorder, whose urine had been previously rendered acid, no disturbance of kidney function was noted either during or after the experiment.[14] The specific gravity of the urine varied between 1.018 and 1.021, indicating a high concentration of salts. Moreover, there are now available studies on rabbits which indicate that the acidity of the urine is entirely unrelated to the rise in blood urea which may follow injection of hemoglobin into these animals. De Navasquez[14] repeatedly injected large doses of hemoglobin solution into rabbits with both acid and alkaline urine, with the result that the excretion rate was higher in the animals having an acid urine and the retention of iron in the kidneys was greater in those with an alkaline urine. Renal function as judged by the phenol red test was normal, though the blood urea was elevated in both groups.

If one turns to the structural changes occurring in the "transfusion kidney" in search for the mechanism of suppression no change of unchallenged significance can be found. It is noteworthy that a skeptical attitude towards the hypothesis that renal failure results from blockage of the tubules by blood pigment prevails in a considerable proportion of the studies on this subject. The prevalence of pigment casts has been quite variable, and it is often remarked that the number of tubules involved appears insufficient to account for a functional disturbance of clinical importance. Estimates on the number of tubules in "transfusion kidneys" showing the presence of pigment are as low as 15 per cent.[14] This percentage, perhaps, is less than the number of nephrons functioning at any given time, and is obviously inadequate to account for suppression. Dilatation of the capsular spaces, usually not a striking change, may be more apparent than real, depending upon the quantity of blood in the glomerular capillaries. Actual measurements indicate that the width of the capsular spaces is within normal limits, and that the apparent increase in width is due to the bloodless or relatively bloodless state of the capillaries and consequent contraction of the glomerular tufts.[14]

The degenerative changes in the tubules are quite striking, frequently characterized by an intense catarrh or actual necrosis, and deserve serious consideration as the basis of suppression. It is not difficult to form the impression that loss of selective reabsorptive power on the part of the damaged tubules constitutes the mechanism of renal shutdown. The urine is a dilute fluid showing poor concentration of urea and only slight resorption of the chlorides. These are the characteristics of a poorly concentrated filtrate and suggest that the mechanism at fault is "excessive but unselective" resorption of the glomerular filtrate, that is, a spillage back into the blood stream. This same explanation has been proposed for traumatic anuria or myoglobinuria in which the renal structural changes parallel quite closely those occurring in hemoglobinuria.[15]

In spite of rather formidable evidence, structural and functional, centering about tubular damage as the explanation of renal insufficiency, there are facts that apparently exclude this possibility. In cases of obstructive jaundice due to congenital atresia of the bile ducts, identical morphologic changes are present in the kidneys without evidence of clinically important damage to these organs.[16] Indeed, there appear to be no clinical grounds for assuming that deep jaundice of the obstructive type at any age significantly influences renal function. The lack of functional disturbance in so-called bile nephrosis cannot be correlated with the degree or extent of structural damage in the kidneys. A proportion of such cases shows morphologic changes that equal in severity the more marked manifestations seen in suppression due to hemoglobinuria.[12 16]

The interstitial inflammatory reaction occurring in hemoglobinuric kidneys merits consideration only from the standpoint of its relationship to concurrent tubular damage. It has already been pointed out that the interstitial exudate in this condition is regarded as a morphologic manifestation of hyperergy. It is therefore desirable reasonably to exclude the possibility that the tubular changes and the interstitial inflammatory reaction do not form a single process. In most of the recorded fatalities due to excessive intravascular hemolysis, examination of the data bearing on the anatomical changes permits no conclusions on this point. Edema and/or cellular infiltration of the interstitial tissue are not uncommonly mentioned; but merely their presence or absence, their degree and occasionally their distribution have been noted. Recently this subject has been approached with the view of ascertaining whether the interstitial change is

independent of or secondary to the necrosis of the tubular epithelium. In this study on the "transfusion kidney," the distribution and localization of the interstitial exudate coincided rather faithfully with that of necrotic epithelial cells still maintaining attachment to the basement membrane.[12] The change was predominantly present in the boundary zone and cortex about the distal convoluted tubules and collecting ducts, and when it did occur in the pyramids, it was restricted to the vicinity of collecting tubules that contained debris, pigment and pus cells and sometimes showed desquamation of the lining cells. It was further observed that the time of development of the peritubular exudate closely parallels the time of occurrence of epithelial necrosis.

In seven cases of renal suppression due to hemoglobinuria (black water fever in three, and hemolysis due to drugs in four) personally studied, it was not possible always to relate the interstitial inflammatory reaction to areas showing tubular damage. It was apparently true that the distributions of the exudate in the subcortical and cortical zones was, for the most part, such as to suggest that it was secondary to tubular damage. However, cellular extensions along the interlobular vessels in the cortex and both cellular foci and edema in the pyramids in some of the cases appeared to have developed as an independent process.

ILLUSTRATIVE CASES

Case 1.—The patient, a 35-year-old white boiler maker, entered the hospital in shock. Six weeks previously he had recovered from an illness of ten days, characterized by sore throat, fever (103° F.) and disability. Examination showed swollen, congested tonsils, a grayish white exudate on the pharyngeal mucosa and enlargement of the cervical, submaxillary and posterior auricular lymph nodes. In view of the leukocyte count of 15,700 with 53 per cent lymphocytes, many of which showed undue basophilism of the cytoplasm, the diagnosis of acute infectious mononucleosis was entertained. The heterophile agglutination test was subsequently positive in dilution of 1:7168.

Forty minutes before the last entry, while working in a boiler, he developed dizziness and a substernal sensation of uneasiness. On reaching the hospital he appeared anxious and apprehensive, showed cold, clammy skin, and complained of substernal constriction. The temperature was 97° F. and the pulse was feeble and much too rapid to count. The blood pressure was 90 systolic and 50 diastolic. The cardiogram showed a ventricular rate of 300 per minute and an indeterminate auricular rate. The QRS duration was 0.16. The interpretation of these changes are paroxysmal ventricular tachycardia.

Vomiting began within the first hour and continued in some degree throughout his course. The blood pressure continued to fall (76/40) and signs of pulmonary edema developed. Since quinidine by mouth could not be retained, 7½ grains of quinine dihydrochloride in a liter of 5 per cent glucose solution was begun as infusion. When 100 c. c. were absorbed, the patient ceased breathing, the eyes became fixed and the pupillary reactions disappeared. After a few minutes of artificial respiration the heart sounds were again audible, at first only a tap at great intervals, perhaps 10 seconds, and then normal rhythm ensued at the rate of 120 per minute. He continued to improve and within 2 hours talked rationally.

The blood pressure during the first 24 hours was subnormal, but then reached 120/80 and maintained a normal or elevated level (as much as 170/120) throughout the remainder of his course. After the first 12 hours the temperature was in the range of 99 to 100° F., but showed a terminal elevation of 102° F. The output of urine was greatly decreased from the beginning, amounting to 205 c. c. during the first 2 days. Thereafter the amount was often less than 100 c. c. per day and never more than 150 c. c., in spite of liberal quantities of saline and glucose solution as infusions.

The blood urea nitrogen rose from a level of 24 mg. per cent on the second day to 161.2 mg. per cent on the tenth day. The sodium chloride was 568 mg. per cent and the carbon dioxide combining power was 44 volumes per cent. Examination of the blood revealed a white cell count of 15,400 with 83 neutrophils, and a red cell count of 4,780,000 with 94 per cent hemoglobin. The Kahn and Kolmer were negative. Analysis of the first specimen of urine showed 2 plus albumin and specific gravity of 1.023. On the sixth day urinalysis revealed 3 plus albumin and specific gravity of 1.009.

Towards the end the patient became stuporous and finally lapsed into coma. Signs of pulmonary edema were present before death, which occurred on the eleventh day.

Postmortem examination revealed moderate generalized subcutaneous edema, bilateral hydrothorax and small hemorrhages in the skin, conjunctiva and pericardium. The lungs were congested and edematous. The heart weighed 350 grams and showed no gross myocardial or valvular lesions. A few small atheromata were present in the coronary arteries and in the supravalvular region of the aorta. The spleen was slightly enlarged and showed firm, dark, red cut surfaces. The liver weighed 1,600 grams and on section, showed light brownish red, wet surfaces with the lobular etching essentially undisturbed. Apart from edema, the gallbladder, pancreas, gastro-intestinal tract and mesentery appeared essentially normal. The adrenals were of average size and otherwise negative.

The combined weight of the kidneys was 450 grams. Their capsules stripped readily, leaving smooth grayish red surfaces. The cut surfaces were somewhat bulging, wet and glistening, and the markings were blurred especially in the boundary zone. A streaked effect due to irregular lines of red alternating with gray was present in the cortex. Petechial hemorrhages were present in the lining of both pelves. The ureters appeared normal. The urinary bladder was contracted and contained a few c. c. of turbid urine. The prostate was not enlarged.

Sections from the kidneys showed the structure of acute interstitial nephritis. Lymphocytes and plasma

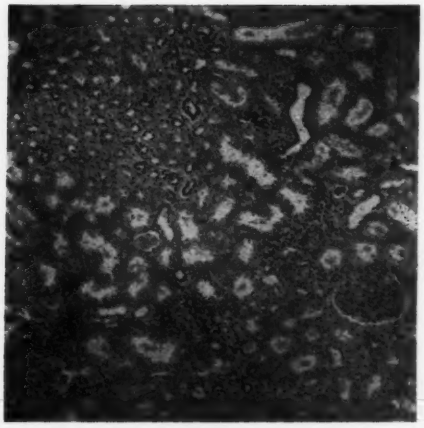

Fig. 1, Case 1
Section from cortex showing focal interstitial nephritis and moderate dilatation of the tubules.

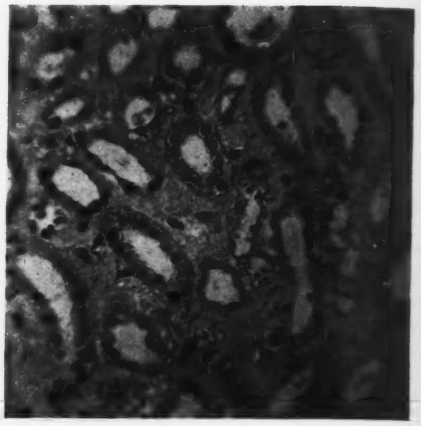

Fig. 2, Case 1
Interstitial edema in medulla.

cells chiefly, but also neutrophils and eosinophils infiltrated the interstitial tissue of the cortical and subcortical zones. The exudate was focal in distribution, but this was not sharply so in the subcortical zone. Cellular accumulations around the interlobular vessels was a fairly prominent feature. Some edema was usually present in the locations of the cellular foci and this change was especially noticeable between the collecting tubules in the pyramids. Some of the capsular spaces were wide, but in such instances the glomerular tufts appeared contracted. Moderate tubular dilatation of a somewhat patchy distribution was present in the cortex. An exudate was often present in the lumen of segments of tubules that were surrounded by marked cellular inflammatory reaction.

Focal cellular accumulations similar to those in the kidney were present in the interstitial tissue of the pancreas, around the blood vessels of the myocardium and in the pericardium.

The diagnosis of infectious mononucleosis in this case appears to be well supported by both the clinical and hematologic data, although it might be suggested that the duration of illness was less than the average. Acute interstitial nephritis, either during active disease or as a latent complication, has not been observed in infectious mononucleosis so far as I know. It is possible that this is an instance of such a complication. However, it is tempting to suspect that a streptococcic infection of the throat may have been present also. Streptococcus hemolyticus is known to be capable of producing a state of hypersensitiveness of the tissue cells in a number of organs. Among these, the heart and kidney, judging from the prevalence of characteristic histologic manifestations, appear to show a fairly high incidence of such involvement. Would it, then, be too far-fetched to suspect that the dramatic onset in this case was due to an anaphylactic type of reaction, resulting from discharge of bacterial antigen (streptococcus?) from an undetermined focus in a patient whose body cells were already in a hypersensitive state? This would be an acceptable explanation for the shock which persisted during the first twenty-four hours, even after disappearance of the cardiac arrhythmia. The oliguria appears to have been a functional manifestation of the same reaction, but the exact mechanism of renal shutdown is quite obscure. The structural changes in the kidneys, for reasons already discussed, fail, in my opinion, to provide a satisfactory explanation for suppression. The blood pressure was adequate after the first twenty-four hours, actually elevated towards the end. Vomiting was present, but this was relatively unimportant after the first 2 days. Moreover, liberal quantities of glucose and saline solution were provided and the blood chlorides showed a normal level.

Case 2.—A 39-year-old white male entered the hospital with a deep jaundice. He had drunk heavily for years, as much as a quart of whiskey daily. Six weeks before entry he developed anorexia, insomnia and restlessness. Progressive, painless jaundice was noticed two weeks later. The abdomen became distended. The stools were clay colored and the urine was dark. There was a weight loss of 22 pounds.

Examination revealed an intense, diffuse jaundice and a fair state of nutrition. The temperature was 98.6° F., pulse 88 and respirations 26 per minute. The blood pressure was 140/88. Examination of heart and lungs was negative. The abdomen was distended and showed the presence of fluid. The liver edge was felt five finger-breadths below the right costal margin; the spleen

was not palpable. Examination of the genitalia, rectum and reflexes was negative.

The leukocyte count was 35,850 with 90 neutrophils, and the red cell count was 2,370,000 with 46 per cent hemoglobin. The icterus index ranged from 200.6 to 240. The blood sugar was 104 mg. per cent. The serum protein was 5.15 grams, the albumin 2.19 grams and the globulin 2.96 grams per 100 c. c.

The total output of urine on the second day was 120 c. c. and on the fourth day, 5 c. c. After this there was complete suppression. The urine showed 2 plus albumin, specific gravity 1.015, and an occasional hyaline and granular cast. The nonprotein nitrogen was 209.5 mg. per cent on the fourth day.

He expired on the seventh hospital day.

At autopsy the following anatomical diagnoses were made: intense jaundice; edema; bilateral hydrothorax, slight; ascites (3 liters); atelectasis of right lower lobe of lung; acute sero-fibrinous pericarditis, secondary to uremia; chronic congestive splenomegaly (600 grams); alcoholic cirrhosis of liver; enlargement and pigmentation of kidneys; and uremia.

The equal-sized kidneys weighed 400 grams. Their external surfaces were smooth and quite dark, perhaps greenish black. The cut surfaces were moderately swollen and edematous and deeply pigmented, especially in the pyramids. The architectural features were not altogether distinct. The lining of the pelves and ureters was normal except for jaundice. The urinary bladder was contracted and empty, and edematous blebs were present in the jaundiced mucosa. The prostate was not enlarged.

The sections from the kidneys revealed, in addition to characteristic structural manifestations of bile nephrosis, interstitial edema of both the cortex and medulla. This change showed a tendency toward focal distribution about the vascular poles of the glomeruli and the interlobular vessels, but this was not sharp. In the pyramids the edema was more marked and diffuse. A sprinkling of plasma cells, lymphocytes and eosinophils was occasionally observed in the edematous foci, but usually no cellular reaction was present. Rare dense cellular collections were present in the interstitial tissue of the subcortical zone. The edema did not appear to be secondary to degenerative changes in the tubules resulting from bile pigment. In the first place, the changes in the tubules were not of the order to produce an interstitial reaction; and secondly, the distribution of the edema was not localized to areas showing tubular degeneration, although both changes were frequently present in the same area. There was moderate dilatation of the tubules.

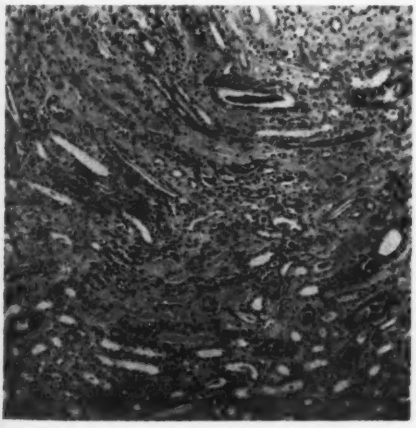

Fig. 3, Case 2
Interstitial edema of medulla not secondary to damage of tubules.

Oliguria or anuria with subsequent uremia, not due to dehydration or low blood pressure, may be encountered in a number of hepatic diseases. The complication has been observed personally in amebic abscess of the liver, in hepatic abscesses due to ascending cholangitis and in the present case of fairly acute alcoholic cirrhosis. It has been reported in instances of traumatic damage of the liver,[17] carcinoma[17] and subacute atrophy.[18] In the "liver-kidney syndrome" following damage to the liver, suppression has been attributed to dysfunction of the tubules due to degenerative changes.[17] The degenerative manifestations have been compared to the tubular changes (nephrosis) in "pregnancy toxemias," a disease in which the structural alteration in the tubules are believed not significantly to influence renal function. Those who favor this explanation regard the interstitial nephritis as secondary to degeneration of the tubules. This has been challenged on the grounds that the tubular changes are not severe enough to excite an interstitial reaction, and also that the distribution and localization of the exudate fail to support such a relationship.[6] This appears to be correct and would seem to support the interpretation that the interstitial nephritis represents a structural manifestation of a hyperergic reaction. In instances of liver injury unassociated with infection, it has been hypothecated that foreign proteins or their split products derived from necrotic liver cells or passing undetoxified from the intestines form the sensitizing antigen.[6]

Case 3.—This is an instance of black water fever in a 70-year-old white male who died of anuric uremia eight days after the onset of hemoglobinuria. The nonprotein nitrogen of the blood was 186 mg. per cent on the day preceding death. The blood pressure was 128/84. There was no vomiting.

The kidneys weighed 450 grams and showed a few scars characteristic of arteriosclerosis. Section revealed somewhat bulging, moist surfaces which showed a dirty greenish brown color diffusely. The architectural features were partially obscured. The renal pelves were jaundiced and the right contained hemolyzed blood. The bladder contained a half ounce of dark red fluid and showed jaundice of the mucosa. The right lobe of the prostate was moderately enlarged.

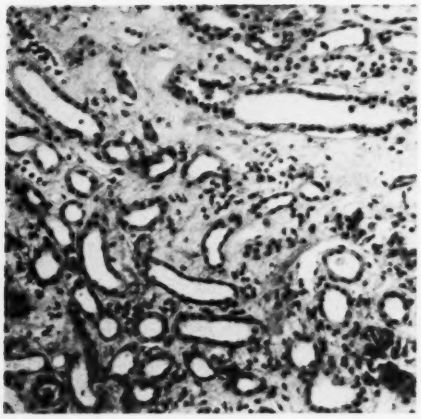

Fig. 4, Case 3
Edema of medulla apparently not secondary to tubular changes.

Microscopic Examination.—The capsular spaces were apparently widened in many of the glomeruli, but this was often associated with contracted tufts that were essentially bloodless. Some swelling of the capsular epithelium was present. Tubular dilatation was fairly conspicuous mainly in the pyramids. Apparently less than a fourth of the distal convoluted and collecting tubules contained pigment, showing either brick red or green color. Both types of pigment were present in the distal convoluted and collecting tubules. Segments of tubules containing pigment were usually dilated and showed flattening of lining cells. Catarrhal manifestations, such as desquamation and proliferation of the lining cells, were frequently noted in the pigment bearing tubules. Foci of edema and cellular inflammatory reaction were present in the cortex and boundary zone, usually in relationship to distal convoluted tubules and collecting ducts that showed necrosis. However, the interstitial change in such foci often showed the necrotic tubule or tubules at its margin and not at the point of most marked reaction. In the pyramids, where interstitial edema was diffuse, there was no difficulty in establishing the independent nature of the reaction.

As already pointed out, the interstitial change in the "transfusion kidney" has been considered secondary to tubular damage. In the present case of black water fever it seems clear that at least a part of the interstitial reaction is independent of tubular damage. There are many areas in which tubular necrosis and an interstitial reaction are co-existent and a relationship cannot be excluded. However, tubular damage certainly cannot be held responsible for the diffuse edema in the interstitial tissue of the pyramids.

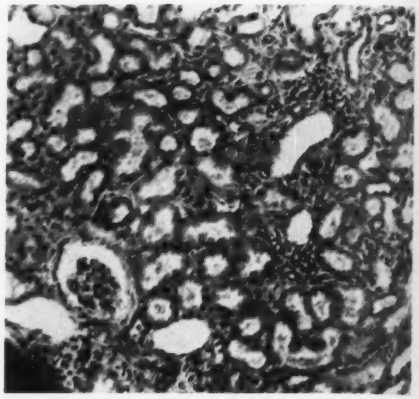

Fig. 5, Case 3
Interstitial nephritis in cortex not secondary to necrosis of tubules.

SUMMARY

Oliguria or anuria, not due to ordinary forms of renal disease, low blood pressure or dehydration, may be encountered in the course of a variety of infectious states, liver necrosis and excessive intravascular hemolysis. The suppression may terminate spontaneously in diuresis and recovery, or may end in death from uremia. In the fatal cases the kidneys are usually swollen and show the structural change of acute interstitial nephritis. A variety of morphologic changes may be present in the nephron proper, but none of these is of unchallenged significance. The morphology that characterizes this condition is the interstitial lesion, and while it may vary considerably in degree, there are no structural details of the exudate itself that distinguish the disease processes of which it forms a complication. This lesion is known to be a structural manifestation of hyperergy in hemolytic streptococcus infections, and it is believed to have the same significance in interstitial nephritis found in association with excessive intravascular hemolysis and liver necrosis.

The exact mechanism of renal failure is obscure. Compression of the tubules and blood vessels by the interstitial exudate cannot be definitely excluded in all cases, but this at the most is likely to be a contributing factor, if at all concerned. Perhaps systematic studies on renal function in cases of leukemia during the course

of clinical management might, when correlated with therapeutic measures and autopsy findings, yield information of decisive significance on this point. The view has been expressed that renal insufficiency in this condition is a functional manifestation of a hyperergic reaction. This theory has the advantage of being nebulous enough to cover the full scope of functional abnormalities that might be concerned in the production of suppression, and at the same time it is reasonably well supported by the structural changes and clinical facts.

I am indebted to Drs. T. P. Lloyd and W. F. Drummond, of the Highland Sanitarium, for the clinical facts in Cases 1 and 2.

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A CASE OF HYPERACTIVE CAROTID SINUS REFLEX WITH ELECTRO-CARDIOGRAPHIC CHANGES DURING MECHANICALLY INDUCED SYNCOPE*

By IRVING A. GAIL, M. D.
Lexington, Kentucky

Since Weiss and Baker[1] reported their series of 15 cases in 1933, syncope and convulsions due to a hyperactive carotid sinus reflex are being recognized with increasing frequency. Three types of carotid sinus syndrome are now differentiated, namely:

(A) The vagal type, in which unconsciousness results from cerebral anoxemia, due to reflex cardiac asystole.

(B) The depressor type causes syncope due to primary vaso-dilatation and secondary depression of the blood pressure, unrelated to cardiac arrhythmia or asystole. The decreased blood flow to the brain causes cerebral anoxemia, with resultant syncope.[2]

(C) The cerebral type, in which unconsciousness occurs without any significant change in the heart rate or blood pressure, and there is no alteration in the blood flow through the brain.[3]

A case is herewith reported of bilateral hyperactivity of the carotid sinus, vagal type, with graphic demonstrations of cardiac changes during mechanically induced syncope.

CASE REPORT

A white male, 44 years of age, was admitted to the Veterans Administration Facility, Lexington, Kentucky, on March 26, 1942, as a transfer patient from a city hospital where he had been sent following a "seizure" which occurred while he was incarcerated in the county jail on a charge of disorderly conduct.

The patient said that about two years prior to his admission he fell unconscious while stepping off a street curb. When he awakened he was under observation at a city hospital where he remained several hours, but was discharged upon his insistance. According to the patient's statement, he went "blank"; had no aura preceding the loss of consciousness; he was amnesic for the period during which unconsciousness lasted; and he experienced no significant sequelae. Since the onset of his illness the patient said he had had a total of eleven periods during which consciousness was lost. They varied in duration from several minutes to a "few hours" —and on several occasions he was told he had struggled

*Received for publication August 20, 1942.
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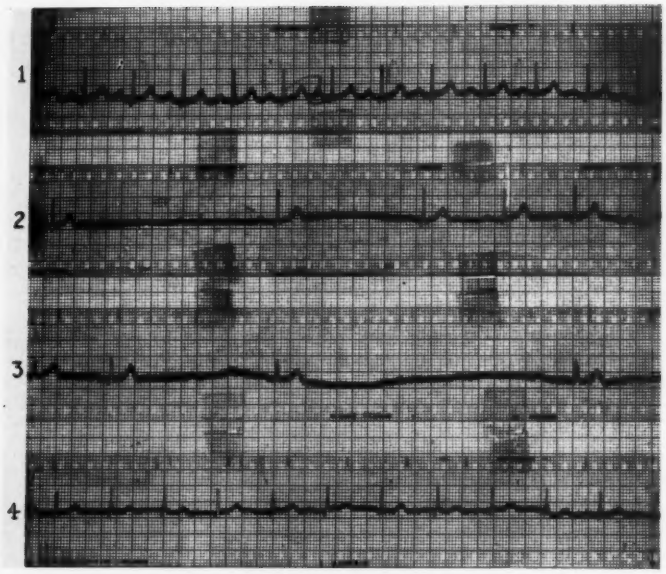

Fig. 1, lead 2. Routine electrocardiogram. Within normal limits.

Fig. 2, lead 2. Electrocardiogram, following 16 seconds of digital pressure on the left carotid sinus. A-V blocks and ventricular asystoles demonstrated.

Fig. 3, lead 2. Electrocardiogram following 12 seconds of digital pressure on the right carotid sinus. Findings similar to *Fig. 2*.

Fig. 4, lead 2. Electrocardiogram following atropine. Prolonged digital pressure on the left and right carotid sinuses respectively showed no variation from normal.

and thrashed about. Being an individual of quick temper, the patient frequently became involved in fisticuffs and was several times arrested on charges of disorderly conduct. He noticed that during these periods of emotional disturbance he was especially liable to become nauseated, dizzy and dyspneic; and he twice lost consciousness under these circumstances. The last seizure prior to admission occurred while the patient was in the county jail and during this seizure he was observed in rather severe convulsive movements. For several months prior to hospitalization the patient had also noted tingling sensations in both feet.

Physical examination revealed a well developed and nourished white man, who was not acutely or chronically ill. His blood pressure was 118/90; rate 92. Examination was essentially negative.

Neurologic examination revealed no significant findings aside from subjective complaints of unconscious "spells," nervousness, and tingling sensations of the lower extremities.

Urinalysis was negative, except for the presence of occasional white blood cells. Blood count, Wassermann and Kahn tests, blood chemical examination, spinal fluid examination, and basal metabolic rate, all were negative. Electrocardiogram revealed a normal record, rate 94 (*Fig. 1*). As a diagnostic procedure testing of carotid sinus sensitivity was indicated.

Procedure.—The patient was seated and digital pressure was applied over the left carotid sinus for 16 seconds, when he began to complain of feeling faint and dizzy, became pale and nauseated, and his increased respirations were shallow. His blood pressure fell from 118/90 to 92/72 and then could no longer be recorded. Syncope ensued. An electrocardiogram taken during this procedure showed ventricular cardiac standstill for 2.8 seconds, but during this period P-waves were present indicating A-V blocks. The next QRS occurred 1.8 seconds later, but a P-wave appeared 0.92 seconds after the preceding P-wave. The next QRS occurred 1 second later, after which normal rhythm was restored (*Fig. 2*).

Thus, by the application of digital pressure over the left carotid sinus, we were able to induce symptoms of dizziness, dyspnea, nausea, sweating, hypotension, bradycardia, cardiac asystole and finally syncope which resulted from cerebral anoxemia during the period of cardiac asystole.

After the patient had been allowed an adequate period of rest, pressure was applied over the right carotid sinus. Symptoms similar to those produced by left sinus pressure were elicited requiring only 12 seconds of stimulation. An electrocardiogram at this time showed a prolonged ventricular asystole of 3.8 seconds, which followed several asystoles of shorter durations and also A-V blocks (*Fig. 3*).

Having obtained marked evidence of vagal type carotid hypersensitivity, it was decided to see whether the response to pressure would be abolished by atropine, which affects the vagal terminal nerve organs. The patient was therefore given four oral doses of atropine sulfate, 1/100 grains each, in 24 hours.

Digital pressure was then applied over the left and right carotid sinuses, respectively, for periods of 30 seconds each. No clinical symptoms were elicited and electrocardiogram was essentially negative (*Fig. 4*).

COMMENTS

A case of vagal type bilaterally hyperactive carotid sinus is presented in which an electrocardiographic record was made, during mechanically induced syncope. The electrocardiogram revealed prolonged ventricular asystoles ranging up to 3.8 seconds, and A-V blocks. This disturbance of normal cardiac action resulted in cerebral anoxemia, which in turn caused syncope.

Atropine sulfate abolished cardiographic and clinical findings of carotid-sinus sensitivity, es-

tablishing the diagnosis and therapeutic criteria in this case.

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A STUDY OF THE INCIDENCE OF TRICUSPID REGURGITATION AT A LARGE GENERAL HOSPITAL IN THE SOUTH*

WITH A REPORT OF TWO CASES

By TRAVIS WINSOR, M.D.

and

GEORGE E. BURCH, M.D.

New Orleans, Louisiana

Tricuspid regurgitation has been known for many years. King presented an excellent description of functional tricuspid regurgitation in the Guy's Hospital Report in 1837.[1] In 1866 Parrot[2] noted pulsations in the neck of puerperal women which he ascribed to anemic dilatation of the tricuspid ring. Although tricuspid regurgitation has been recognized for over 100 years, it is infrequently diagnosed at the bedside. Major[3] reports that tricuspid regurgitation is the most frequently missed of all cardiac states. It has been stated that pathologically the tricuspid valve is involved in 20 to 25 per cent of patients with mitral disease.[4] It was considered of interest to study the incidence of tricuspid regurgitation at a large general hospital in the South, since it was felt that a diagnosis of tricuspid regurgitation is seldom entertained clinically, but is frequently encountered at necropsy.

Between January, 1937, and January, 1942, 287,257 patients entered the wards of Charity Hospital in New Orleans, and 21,642 (7.5 per cent) were discharged with a diagnosis of heart disease. In only 14 (0.07 per cent) of the latter patients was a diagnosis of tricuspid regurgitation made. Thus a clinical diagnosis of tricuspid regurgitation was made in approximately one out of every 1,400 patients with heart disease. During this same period, 6,225 consecutive autopsies were performed and 10 (0.16 per cent) showed anatomic evidence of organic tricuspid disease with regurgitation.

The clinical diagnosis of organic tricuspid regurgitation was made on approximately one in 20,000 patients entering the hospital and an autopsy report of tricuspid regurgitation was recorded on approximately one in 626 patients.

The clinical and autopsy incidence of tricuspid regurgitation in this series is extremely low when compared with the incidence reported by others.[5 6 7] Emerson[5] states that functional tricuspid regurgitation is present in all dilated hearts. Mackenzie[6] pointed out that the tricuspid valve is the regulator of the intracardiac pressure and that relative regurgitation takes place when the intracardiac pressure rises as in exercise or excitement. The evanescent systolic murmur which frequently is heard over the tricuspid area following exercise is said to be evidence of relative tricuspid regurgitation. Kerr[7] says that a relative insufficiency is common in congestive heart failure, particularly in the presence of right heart failure. The thinness of the auricular wall and the size and arrangement of the valves predispose to relative tricuspid regurgitation. Any condition which produces a relaxation of the sphincter action of the tricuspid ring may produce a relative insufficiency. Puerperal fever, sepsis, pneumonia, scarlet fever, diphtheria, rheumatic fever, anemia, diabetes, pulmonary disease, mitral stenosis, aortic regurgitation, and malnutrition have all been listed as etiologic factors producing relative tricuspid regurgitation.

Organic tricuspid regurgitation due to acquired or congenital lesions, is rare.[5 6 7] This is in agreement with the incidence of organic regurgitation found at Charity Hospital. Acquired organic lesions of the tricuspid valves are frequently caused by bacterial valvulitis, or rheumatic fever. The pneumococcus, streptococcus, or gonococcus are common etiologic agents. Traumatic rupture of the tricuspid valve has been reported. Norris and Landis[8] state that rheumatic fever causes 35 to 62 per cent of the cases of organic tricuspid insufficiency. Herrmann[9] states that the tricuspid leaflets are affected in one-third of all patients with rheumatic mitral valvulitis. Rheumatic fever in-

*Received for publication September 3, 1942.

*From the Department of Medicine, School of Medicine, Tulane University and Charity Hospital of Louisiana, New Orleans, Louisiana.

volves the tricuspid valves relatively frequently; however, it rarely does so as an isolated lesion.

Of the ten patients in the Charity Hospital series with organic tricuspid regurgitation, six showed lesions of bacterial endocarditis on the tricuspid valves. The organisms were not identified. Of the four remaining, two had rheumatic, one pneumococcic and one streptococcic vegetations upon the leaflets which produced regurgitation.

It appears from a study of the literature and the Charity Hospital records, that the physician, including the internist and cardiologist, are not likely to make a diagnosis of functional tricuspid regurgitation. The soft blowing murmurs frequently heard over the tricuspid region are either ignored or considered of mitral valve origin. There is no doubt that because of the fact that the tricuspid area is often neglected, many instances of a disturbance, functional or organic are missed clinically. In the Charity Hospital series the ratio of clinical diagnosis to pathologic diagnosis of tricuspid regurgitation due to organic valvular disease was apprixomately 1 to 30. From the case histories it was impossible to determine the relative incidence of the diagnosis of functional regurgitation. It is impossible to state the incidence of the correct diagnosis of tricuspid regurgitation generally, but it would not be surprising to find the incidence low. Because of such a great error in the clinical diagnosis of regurgitation of the tricuspid valve it was considered advisable to describe two patients with the disease state and to describe rather briefly certain of its physiologic and clinical aspects so that it will be more frequently diagnosed correctly.

CASE REPORTS

Two patients are presented to show the clinical and pathologic manifestations of tricuspid regurgitation. In the first patient, the clinical picture was typical while in the second the picture was not typical.

Patient 1.—M. C., a 28-year-old colored housewife, entered Charity Hospital on November 21, 1941, complaining of swelling of the abdomen of 14 days' duration.

On November 7, 1941, she noted slight swelling of the ankles and marked swelling of the abdomen which was worse at night. She experienced little breathlessness on exertion. Her abdomen and ankles enlarged progressively during the 14 days prior to entry.

At the age of three the patient had fever and polyarthritis. Since, she has had semi-annual attacks of substernal pain and palpitation.

On examination, the temperature was 96°, pulse rate 154, respiratory rate 31, blood pressure 110 millimeters of mercury systolic and 70 diastolic. There was auricular fibrillation. The neck veins were markedly distended, and pulsated vigorously and irregularly. The left precordial region heaved with every pulsation of the heart. The heart was markedly enlarged to the right and to the left. There were typical physical signs of stenosis and insufficiency of the mitral valve. A loud harsh systolic murmur and thrill, transmitted to the right subclavicular region were identified over the lower portion of the sternum. The breath sounds, inferior to the left scapula posteriorly, were bronchial. The liver was enlarged to the umbilicus and pulsated markedly. There was ascites and slight edema of the ankles.

The blood picture showed a slight anemia and a mild leukocytosis. The urine was normal except for a trace of albumin. The nonprotein nitrogen of the blood was 48 milligrams per cent. Blood cultures were negative.

The electrocardiogram showed a ventricular rate of 150, auricular fibrillation, right axis deviation with a mean ventricular electrical axis of plus 114 degrees. X-ray showed a bilaterally enlarged globular, sloped heart, and accentuation of the pulmonary conus.

Fluoroscopic examination showed extreme cardiac enlargement to the right and left. The trachea and esophagus were shifted to the right in the region of the left auricle. Jugular venous tracings showed a ventricular type of curve (*Fig. 1*). She was discharged on February 6, 1942, clinically improved.

This patient illustrates a case of tricuspid regurgitation in which all of the typical signs were present. The pulsating jugular veins and liver, marked ascites and characteristic murmur and thrill were outstanding features of the examination. A jugular venous tracing showed the typical prominent ventricular pulsations which are frequently seen in this condition (*Fig. 1*). The insufficiency may have been organic or functional, the latter being caused by dilatation of the tricuspid ring secondary to the existing mitral stenosis. There were two findings which indicated organic tricuspid involvement. (1) The signs of right ventricular con-

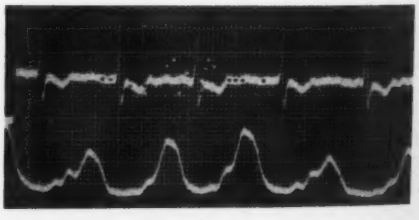

Fig. 1

Electrocardiogram (Lead 1) and jugular pulsations recorded on Case 1 on December 22, 1941. The venogram shows large ventricular waves and an absence of auricular waves. The complexes can be correlated with the electrical activity of the heart as indicated by the accompanying electrocardiographic tracing.

gestive failure were relatively great when compared to the mild signs of left ventricular failure. (2) The presence of an intense systolic tricuspid thrill and the long, loud, harsh systolic tricuspid murmur transmitted toward the right shoulder were more suggestive of organic than functional involvement of this valve.

The jugular pulsation as recorded by the polygraph was typical of tricuspid regurgitation as it showed a ventricular type of venous pulse. The tracing showed an absence of the A wave as the patient's heart was in a state of auricular fibrillation. The C wave showed a normal ascending limb, no descending limb, and was continuous with a high V wave (*Fig. 2*).

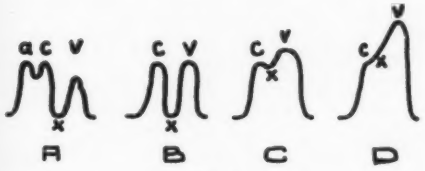

Fig. 2

Jugular phlebograms as seen in patients with varying degrees of tricuspid regurgitation and auricular fibrillation. (A) Normal jugular phlebogram. (B) Early tricuspid regurgitation showing the unaltered X wave and increased amplitude of the V wave. (C) Moderate tricuspid regurgitation showing partial obliteration of the X wave with increased amplitude of the V wave. (D) Marked tricuspid regurgitation showing obliteration of the X wave and increased amplitude of the V wave.

The see-saw movement of the thorax as described by Dressler[10] was present to a moderate degree. With one hand placed on the precordial region and the other hand over the liver, a retraction of the left hemithorax could be felt to occur with an expansion of the right hypochondrium.

Case 2.—A. B., a 17-year-old colored school boy, entered Charity Hospital December 12, 1939, complaining of edema of the legs of 21 days' duration.

On November 19, 1939, the patient noted fever, painful joints, swelling of the feet and ankles and shortness of breath on exertion.

On examination the temperature was 102°, pulse rate 90, respiration rate 30, and blood pressure 20 millimeters of mercury systolic and 80 diastolic. There was auricular fibrillation. The sclerae were slightly icteric. The neck veins pulsated vigorously and irregularly. Occasional subcrepitant rales were heard bilaterally throughout the lungs. The heart was enlarged to the right and left. An early diastolic murmur was heard over the tricuspid area. No systolic murmurs were heard. A non-pulsating liver was palpable four centimeters below the costal margin in the right nipple line.

The blood picture was normal and the urine contained two plus albumen. A teleoroentgenogram of the chest revealed an enormous enlargement of the cardiac shadow to the right and left. The right cardiohepatic angle was obtuse. Fluoroscopic examination showed marked enlargement of the right auricle with displacement of the esophagus to the left. An electrocardiogram showed auricular fibrillation and low QRS complexes and T waves in all leads. Jugular pulsations showed an absence of the A waves and an increased amplitude of the V waves. Liver pulsations were not detected clinically; however, polygraphic tracings showed the hepatogram to be of the ventricular type (*Fig. 3*). On April 22, 1940, he developed marked ascites and cyanosis and death ensued.

Necropsy revealed a cardiac weight of 525 grams. The right auricle, ventricle, superior and inferior vena cava, and coronary sinus were greatly dilated. The right auricular wall measured 0.5 centimeter. The left auricle and ventricle were neither dilated nor hypertrophied. The endocardium of the right auricle and ventricle was gray and thickened. The tricuspid orifice was much enlarged. The free border of the posterior valve cusp was thickened and the papillary muscles were hypertrophied. The corda tendeniae and trabeculae carnae were somewhat thickened. The liver grossly presented a nutmeg appearance. There was microscopic evidence of central lobular necrosis and fibrosis of the portal spaces.

In this patient tricuspid regurgitation was diagnosed clinically in the absence of the typical murmur and pulsating liver. It has been repeatedly shown that a small or moderate degree of regurgitation will produce the typical tricuspid systolic murmur, whereas extreme enlargement will cause a disappearance of this murmur.[6] Pratt[11] says that there is no murmur

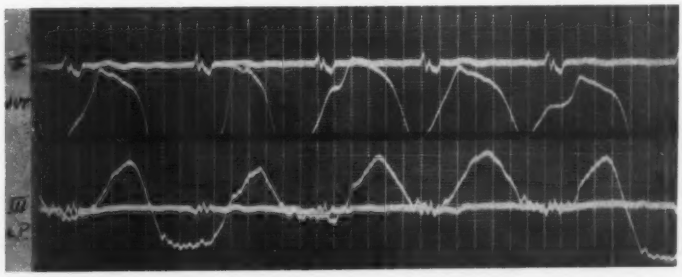

Fig. 3

Electrocardiographic tracings (Leads II and III) right jugular venogram and hepatogram recorded on January 30, 1940, on *Case 2*. The venogram and hepatogram showed the typical large ventricular waves seen in tricuspid regurgitation.

of tricuspid insufficiency when the cardiac dilatation is great or when the myocardium is weak. Griffith[12] says that a dilated heart may produce an intensification of tricuspid regurgitation by the placing of the origin of the cordae tendeniae to a point more distant from the tricuspid ring, thus preventing coaptation of the valve leaflets by the relatively shortened tendons. When the finer pulsations of the liver were mechanically recorded simultaneously with the jugular pulsations a ventricular hepatic pulsation was found similar to that described by Mackenzie.[6]

The marked enlargement of the cardiac shadow to the right was produced by the right auricle, while the enlargement to the left was produced by the right ventricle, the left ventricle being hidden posteriorly. These findings were confirmed at autopsy. The extreme dilatation of the right auricle, sinus of Valsalva, superior and inferior vena cavae and hepatic veins as well as the collapse necrosis of the liver were all evidence of the strain produced by insufficiency of the tricuspid valves.

DESCRIPTION OF CERTAIN CHARACTERISTICS OF TRICUSPID REGURGITATION

Pathologic Physiology.—Tricuspid regurgitation occurs whenever right ventricular pressure is increased, for example: following moderate exercise. Under such conditions the efficiency of the tricuspid valve is dependent upon certain factors, namely: (1) the pulmonary resistance; (2) the state of the myocardium; (3) the blood volume within the right ventricle; (4) the venous return to the right heart which must be stopped and then reversed if regurgitation is to take place; (5) the high venous pressure in the right auricle as compared with the low pressure in the right ventricle; and (6) the peristaltic action of the myocardium which tends to force blood from auricle to ventricle rather than in the reverse direction. If the forces tending to produce regurgitation overcome those tending to prevent this condition then blood flows from the right ventricle into the right auricle and right auricular dilatation begins. If the right auricle has good tone and dilatation is no more than slight there will be a large venous pulsation transmitted to the jugular vein and to the liver. When the tone of the auricle diminishes and the auricle becomes greatly dilated the typical ventricular pulsation of the jugular vein and liver may disappear. Long-standing tricuspid regurgitation with cardiac cirrhosis of the liver may also make pulsations in this organ imperceptible.

The increased pressure in the right auricle produces fibrillation, hypertrophy and dilatation of the right auricle and visible pulsation of the right hemithorax. Increased pressure in the coronary sinus produces dilatation of the sinus with pericardial effusion which, in the presence of hydrothorax and ascites, presents the picture of Pick's syndrome.

The pulsations of the left hemithorax may be slight in uncomplicated tricuspid regurgitation as the right ventricle is ventrally placed and the left ventricular precordial pulsation is dampened. Fluoroscopically, pulsations of the left border of the heart are vigorous. This border may be the left border of the right ventricle which has hypertrophied to the left so as to obscure the left ventricle in the anterior-posterior view. In prolonged states of regurgitation the left ventricle may diminish in size.

Physical Findings.—The physical findings accompanying tricuspid regurgitation are fairly diagnostic. On inspection, the head jerks with each cardiac systole and the face appears congested and cyanotic or it may be pale with the tips of the ears, lips and fingers blue. The fingers are sometimes Hippocratic, the sclerae jaundiced, and the retinal veins may pulsate. The neck veins are distended and present a ventricular jugular pulsation. The veins of the arms and chest are frequently dilated. If the patient is placed supine with the arm hanging over the edge of the bed, and the arm is raised to about body level, a venous pulsation may be seen in the basilic vein, or, with the patient supine in a position such that the jugular veins are only slightly dilated, pressure on the liver will cause the veins to expand visibly.[7] Observation of the movements of the chest wall shows a diffuse apical thrust. With each ventricular systole the thoracic wall is sucked inward, particularly on the left, producing a picture resembling Broadbent's sign. As the blood is forced into the right lobe of the liver there is an outward bulge of the right hypochondrium, which produces a see-saw appearance to the thoracic cage.[10] Pulsations of the large right auricle may be seen to the right of the sternum in the fourth or fifth intercostal space. The point of maximum impulse is to the left of the midclavicular line. This pulsation is due to the right ventricular enlargement which extends beyond the left border of the left ventricle.

On palpation, the pulsation of the right auricle may be felt to the right of the sternum in the fourth and fifth intercostal spaces. A systolic

thrill over the tricuspid area transmitted toward the right axilla is usually present in the presence of organic tricuspid regurgitation. A systolic shock may be felt with the vigorous contraction of the right ventricle.

On percussion, the area of cardiac dullness extends to the right of the sternum and beyond the left midclavicular line. The dullness produced by the dilatation of the superior vena cava may sometimes be percussed to the right of the sternum.

On auscultation, a systolic murmur, which is transmitted to the right axilla, is heard over the lower end of the sternum or over Fenwick's triangle. A split mitral second sound is frequently caused by a rapid distention of the right ventricle at the beginning of systole.

Precisional Examinations.—Special procedures such as polygraphic tracings of the jugular and hepatic pulsations are an aid to diagnosis. The normal jugular pulse is characterized by a fall of the descending limb of the C wave which aids in forming the X wave (*Fig. 2*). In tricuspid regurgitation the descending portion of the C wave remains elevated or is replaced by a V wave which is regarded as beginning in early systole. If the auricle dilates during regurgitation, the jugular pulsation reaches its peak late in systole.[6] This ventricular type of pulsation is not absolutely diagnostic of tricuspid regurgitation as it has been seen in patients with auricular fibrillation, paroxysmal tachycardia, and congestive heart failure without tricuspid regurgitation.[6]

Fluoroscopic examination usually shows enlargement of the cardiac shadow to the left and right, an extreme pulsation of the right ventricle, and a decreased density of the pulmonary artery.[10] An upward shift of the left leaf of the diaphragm, a marked pulsation of the left cardiac border, a diminished pulsation of the aorta and an absence of pulmonary congestion may be seen.[10] The upper mediastinum may be widened.

The electrocardiogram shows right axis deviation and high, wide and notched P waves. Auricular fibrillation is common and right bundle branch block has been described.

Prognosis.—The prognosis is very poor. This is especially true if the etiology is rheumatic fever, bacterial endocarditis or congenital defect. Jaundice, oliguria or mental changes are signs which indicate an immediate grave prognosis. A tricuspid murmur of diminishing intensity in the presence of a diminishing pulmonary second sound is a sign of right ventricular failure. In general, the prognosis in those patients having primary right-sided failure is worse than those having primary left-sided failure, for when the left ventricle fails first the right ventricle acts as a check which can take over the load temporarily.

SUMMARY

Between January, 1937, and January, 1942, 287,257 patients entered the wards of Charity Hospital. Seven and five-tenths per cent of these patients had a diagnosis of heart disease and in only 14 (0.07 per cent) of the latter was a diagnosis of tricuspid regurgitation made. Of the 6,225 consecutive autopsies performed during this period only 10 (0.16 per cent) showed evidence of organic tricuspid regurgitation. A clinical diagnosis of organic tricuspid regurgitation was made in approximately 1 in 20,000 patients entering the hospital, while an autopsy report of organic tricuspid regurgitation was made in approximately 1 in 626 necropsies. The ratio of clinical diagnosis to autopsy was only 1 to 30.

The case histories of two patients with organic tricuspid regurgitation were presented, and the general features of organic tricuspid regurgitation were discussed in order that the cardiac state might be more frequently diagnosed correctly.

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CHOLINE CHLORIDE IN THE TREATMENT OF ICTERUS GRAVIS NEONATORUM*

By PETER G. DANIS, M.D.
and
W. A. D. ANDERSON, M.D.
St. Louis, Missouri

Severe jaundice and anemia of the newborn is a serious problem which is proportionately becoming more conspicuous with the decreasing infant mortality rate from other causes. In the newborn it is associated with rather definite physical and laboratory findings which vary greatly in degree and intensity and occur entirely independent of sepsis, syphilis, congenital anomalies, leukemia, hemorrhagic disease and true familial hemolytic icterus.

Four separate syndromes, congenital hydrops, erythroblastosis fetalis, icterus gravis and anemia of the newborn have been described in the literature. Originally they were discussed separately but today more as subtitles of the same idiopathic disease.[1] It is not the purpose of this paper to prove the association or dissociation of these conditions. Our experience has been confined to cases in which extremely rapid appearance of icterus has been the dominant symptom. This has been associated with widely varying degrees of erythroblastosis. Hence, until a more suitable and accepted term is found, we shall designate the condition as icterus gravis neonatorum.

The exact etiology of icterus gravis is unknown. Excellent studies on this phase of the disease may be found in the literature.[2 3 4] Receiving most attention today is that of Levine,[5 6] based on Landsteiner and Weiner's[7] studies of iso-agglutinins. In studying the course of this disease, it has been definitely recognized that liver dysfunction plays an important part. The bile pigment excretion is interfered with.[8 9 10 11] There is a disturbance of glycogen[12] and carbohydrate metabolism. Faulty fat metabolism has been suggested by Klemperer,[9] who demonstrated the presence of fatty infiltration with degeneration and necrosis in the cases he studied. Graham[10] has presented evidence indicating a resemblance of the liver findings in this disease to the fatty hepatic degeneration of phosphorus poisoning and he noted its difference from acute yellow atrophy. Zuelzer and Bigler[11] also found abnormal fatty deposits in the liver.

These facts prompted us to study the faulty fat metabolism in three cases of icterus gravis with a favorable outcome and morphological changes in four cases which were studied by autopsy examination. During the course of the disease (*Cases 1* and *2*), we noted that the prothrombin time was abnormally high. We administered bile salts (1-2 gr. daily) with vitamin K. This did not alter the prothrombin time. The administration of vitamin K by hypodermic failed to reduce the prothrombin time. This suggested that the abnormal prothrombin time was not dependent completely on the absorption of vitamin K. In adults in the presence of severe liver damage, the inadequacy of vitamin K has been repeatedly demonstrated.[12] It, therefore, suggested the presence of severe liver damage in these cases. Because of the close relationship between fat metabolism and vitamin K it seems possible that faulty fat metabolism in the liver prevents normal prothrombin formation.

Microscopic sections of the liver (*Figs. 1* and *2*) of the babies dying of icterus gravis showed fatty infiltration as well as the hemopoietic activity usually found (*Cases 3, 4* and *5*). One of these cases was a male who preceded in one family the female whose favorable course is presented (*Case 6*). A similar severe fatty change of the liver was reported by Griffith[13] in choline deficient rats (*Figs. 3* and *4*).

Although extensive studies on fat metabolism have been made, the relation of liver function to it is still uncertain. When neutral fats are absorbed, fat metabolism is carried on in the liver through phospholipid mediation. In the absence of adequate choline, the intermediary catalysis of fatty acids by the liver phospholipid is markedly inhibited, as would be expected of any process dependent upon a regular supply of raw material. Neutral fat then accumulates in the liver in immense proportions. From a normal value of about 3 per cent, neutral liver fat soars to values of 27 to 40 per cent; cholesterol feeding in rats and guinea pigs results in a similar accumulation aggravated by choline lack.[18] Choline, it is now thought, is effective through its labile methyl content. It is probable that in the presence of immense fat deposits of triglyceride, the liver cell, which in its normal

*Presented in part as Scientific Exhibit, Southern Medical Association, Thirty-Fifth Annual Meeting, St. Louis, Missouri, November 10-13, 1941.

*From the Department of Pediatrics and the Department of Pathology, St. Louis University School of Medicine, St. Louis, Missouri.

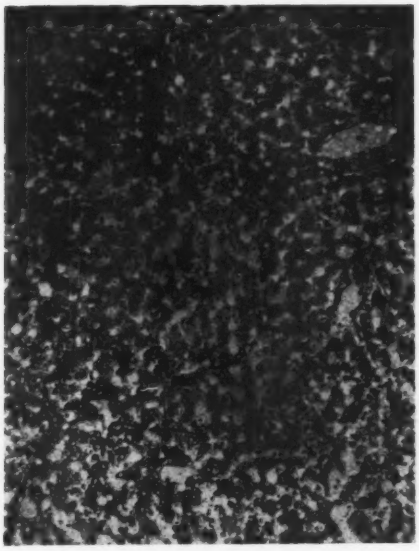


Fig. 1

Low power photomicrograph of liver, *Case 3*, showing fine droplets of fat in the liver cells, and erythropoietic cells in the sinusoids.

Fig. 2

Photomicrograph of liver, medium power, *Case 4*. The abundant vacuoles of lipoid are evident in the liver parenchyma and dark hemopoietic cells crowd the sinusoids.

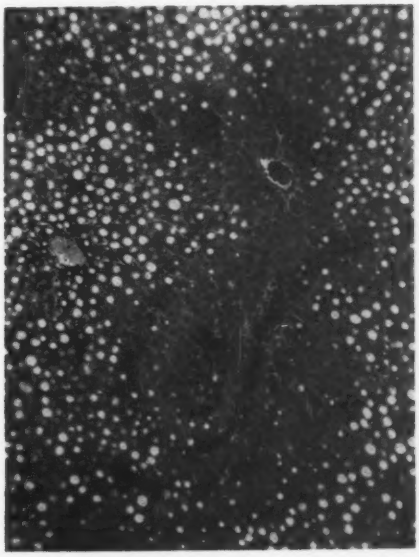


Fig. 3*

Abundant lipoid in the liver of a choline deficient rat.

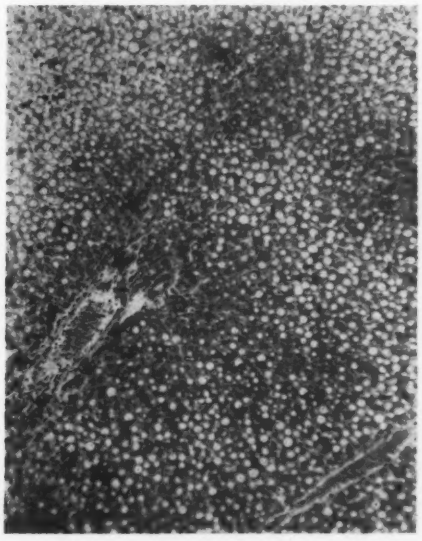


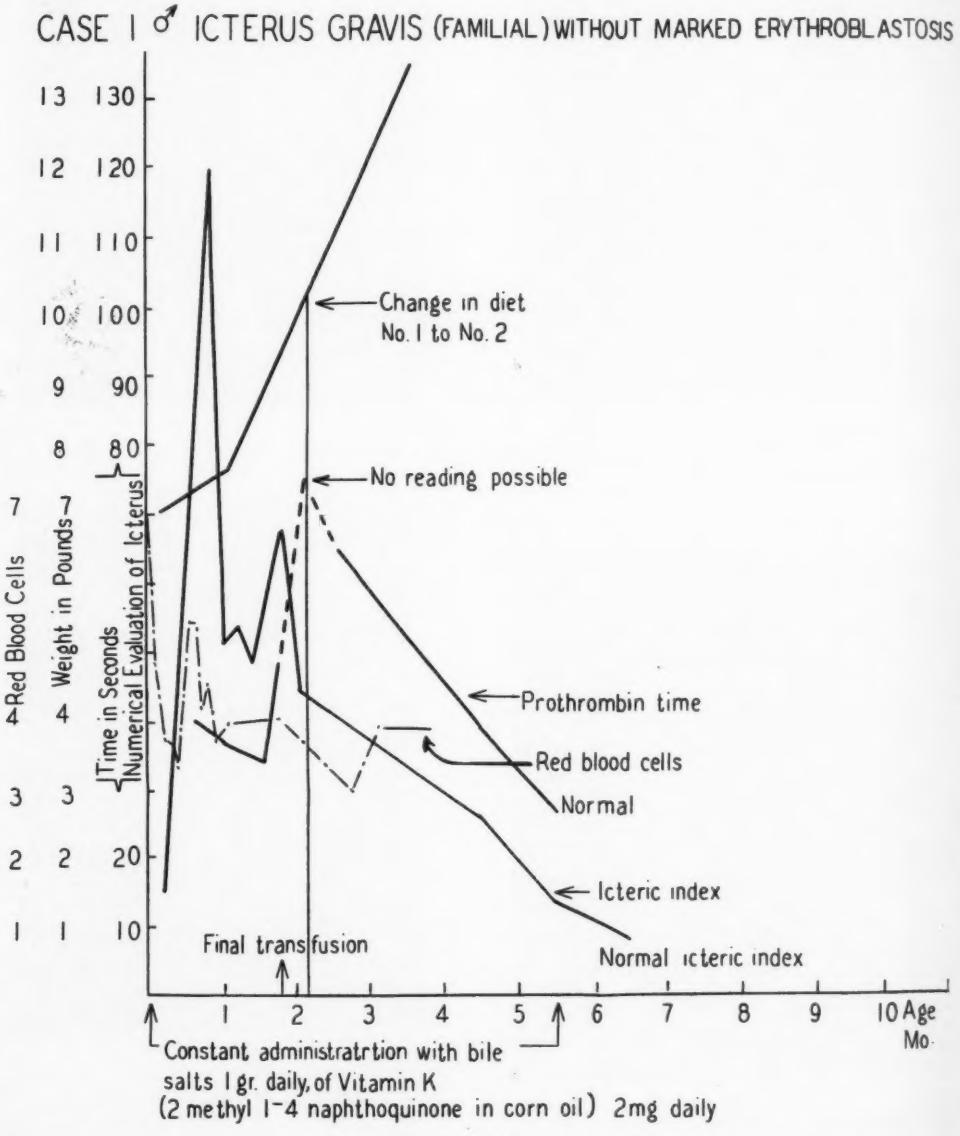
Fig. 4*

Extreme fatty accumulation in the liver of a choline deficient rat.

*Section obtained through the courtesy of Dr. K. Christensen, Department of Micro-anatomy, St. Louis University School of Medicine.

condition contains only a trace of neutral fat, is functioning under an abnormal burden, and may deviate considerably from its normal efficiency and perhaps from its normal metabolism.

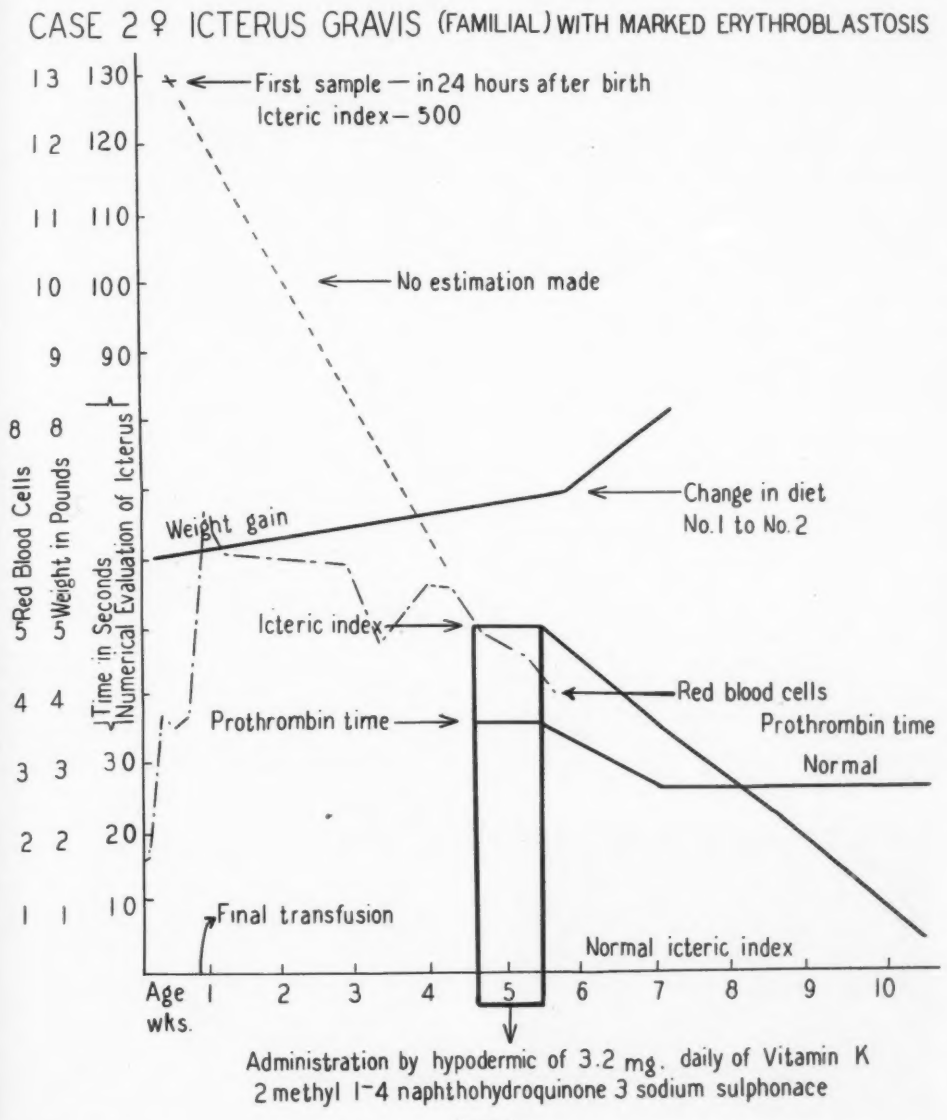
With these considerations in mind, in cases 1 and 2, 5 grains of choline were added to a diet of Mead Johnson's "Olac" (diluted to meet caloric requirements). The latter supplies a form of fat readily absorbed which has less pos-



Graph 1

Diet No. 1.—Breast milk replaced by buttermilk and dextri-maltose on fifth day so diluted to meet caloric requirement.
Diet No. 2.—Olac plus 5 gr. choline chloride.

sibility of forming cholesterol than butter fat[15] and contains labile methyl through the methionine in casein. This was begun after heroic administration of blood transfusions brought the anemia (*Graphs 1* and *2*) definitely under control but had left the babies in that stage in which the jaundice and liver dysfunction had reached a standstill. This therapy was used sufficiently long after the transfusions had been discontinued, that its result could not be de-



Graph 2

Diet No. 1.—Breast milk, supplemented by buttermilk, and completely replaced by it on sixteenth day, diluted to meet caloric requirement.

Diet No. 2—Olac plus 5 gr. choline chloride.

pendent upon the effects of intravenous blood administrations. No untoward effects were observed, but rather recovery seemed to proceed at a somewhat accelerated rate. The prothrombin time returned to normal in direct parallel with the decreasing icteric index (*Cases 1, 2* and *6, Graphs 1* and *2*). Since this study began, the mother of *Case 1* gave birth to a jaundiced baby (*Case 6*) which recovered in a shorter period of time with but three blood transfusions. This child was given the same amount of elixir of choline chloride. The jaundice was severe in this case during the first week, but recovery was complete at six weeks of age. On the fifth day of life the child developed severe opisthotonus. The examined spinal fluid contained excessive bile pigment but no destroyed red blood cells. At four months of age convalescence is proceeding normally.

As a result of the foregoing, *Case 7* was placed on elixir of choline chloride following the diagnosis of icterus gravis clinically from rather classical physical and laboratory findings. The child died of pneumonia of short duration at six weeks of age. Through the courtesy of Dr. George Salmon, resident pediatrician at St. Louis City Hospital, the liver, spleen, and kidney were obtained for examination. These organs on microscopic examination revealed no excessive hemopoiesis nor was there any excess of neutral fat present in the liver (*Fig. 5*).

Case 1, (*Graph 1*).—A well developed male infant, the sixth sibling, was born of an apparently normal mother. The child had no pathologic physical findings. There was no discoloration of the skin and the blood findings were those of polycythemia. Vitamin K was given subcutaneously and within 24 hours a hematoma of the scalp was receding rapidly. At this time, 24 hours after birth, there was a slight icteric tinge to the skin and the polycythemia was rapidly decreasing.

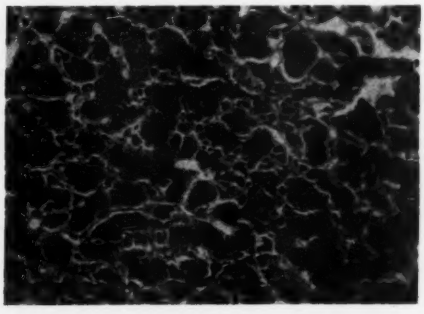


Fig. 5

Photomicrograph of liver, *Case 7*. The cords of liver cells have a relatively normal appearance.

The liver was palpable but no other important physical findings were found. On the third day the red blood count had further decreased and jaundice was more pronounced. The baby was not extremely toxic, and took fluids satisfactorily by mouth. One small blood transfusion was administered. On the fourth day the jaundice was unimproved, and the blood count had further decreased. The stool was colored and milk by mouth was being retained. A second small transfusion of 50 c. c. of blood was administered, and daily injection of 0.5 c. c. of reticulogen was started. On the sixth and seventh days of life, 75 c. c. of blood were administered. Jaundice appeared more severe and the clotting time increased to 6 minutes. Synthetic vitamin K was given by mouth, 4 drops three times a day. The jaundice remained stationary during the ensuing week, with a satisfactory red blood count. On the fourteenth day the stools became lighter in color and by the twenty-first day were definitely alcoholic and remained so for three weeks. Then they became slightly colored and remained thus until the baby was three months of age. The liver, during this period, had become palpable to about two inches below the costal margins. During the period between birth and three weeks of age the spleen became definitely palpable. The infant's condition then remained stationary until one month of age, when anemia again became marked and the spleen became definitely palpable. The infant's condition then remained stationary until it was one month of age, when anemia again became marked and the spleen larger and more easily palpable. During the ensuing month this clinical condition was maintained. An elixir of choline chloride was given, on consultation with Dr. G. Brown, with the purpose of assisting fat metabolism. This was administered at the rate of 5 grains choline chloride daily. The ensuing course was one of slow progress toward normal. This was evidenced by the presence of color in the stool, disappearance of icterus, and a return to normal prothrombin time. The neuromusculature development particularly seemed to increase in rate. The child is now 15 months old, walking unassisted, weighs 26 pounds, and is pronouncing words clearly. The mother and father are living and well. There is no previous history of serious illness in either parent. The mother has given birth previously to, first, a normal girl now aged 7; second, a premature boy who died suddenly at home at seven months; third, a girl with mild anemia, who recovered with liver therapy; fourth, a premature boy who died with severe jaundice at the age of ten days, and fifth, a boy who died of anemia without severe jaundice at the age of seventeen days. Children of previous pregnancies have been seen and treated by competent physicians other than the author. All blood for transfusions was purposely obtained from persons outside the family.

Case 2.—Baby G. (*Graph 2*) weighed 7 pounds, 9 ounces at birth. At the time of birth, examination revealed a markedly enlarged liver, but otherwise the physical findings were those of a normal newborn. There were small purpuric areas on the cheek and hip which prompted blood studies. The red blood count was found to be 1,500,000, the platelets less than 10,000 per 100 white blood cells. The baby was transfused with 50 c. c. of citrated blood from the father. The response to this was satisfactory, but icterus developed within 24 hours. Repeated blood transfusions were

administered until the red blood count reached 5,000,000. Within two weeks after the last blood transfusion, the red blood count was practically normal and there was a definite disappearance of erythroblasts. One month after birth the baby was still jaundiced and was gaining very slowly. After a normal adjustment of diet failed to improve this situation and because the icteric index and prothrombin time appeared to be at a standstill, a diet of "Olac" supplemented with choline was administered. Following administration of the above diet the weight gain became satisfactory, prothrombin time and icteric index both decreased in parallel. Three weeks later the blood count had gradually dropped to 2,800,000. However, with this secondary development of anemia, icteric index, instead of rising, approached normal. The mother and father are living and well. The mother had pneumonia in 1938, at which time she received a blood transfusion from the father. Six years previous to this she had given birth to a normal male. In 1939, she gave birth to a male who died of icterus gravis in three days.

Case 3.—A male full term infant developed severe jaundice and drowsiness within twenty-four hours after birth. The red blood count at this time was 4,200,000 and blood was administered intramuscularly. Twenty-four hours later the red count was 2,800,000 and a blood transfusion was given. Death occurred on the third day. One child had been born five years previously in this family and developed normally. A third child has been born in this family since the death of the case presented here. Autopsy examination showed marked hematopoietic activity in the liver and spleen in addition to the generalized icterus. There was a moderate accumulation of small fatty vacuoles in the liver cells.

Case 4.—A female full term baby appeared normal during the first twenty-four hours of life, but developed a slight icteric tinge on the second day. The infant was the third child of parents who were apparently normal. The baby died suddenly on the third day following symptoms of acute pain and shock. Autopsy examination showed 60 c. c. of free blood in the peritoneal cavity, which apparently was derived from rupture of a large subcapsular hematoma of the liver. The cut surface of the liver had a yellowish tinge. Microscopically, the liver showed an abundance of erythroblastic cells. The parenchymatous cells of the liver were filled by numerous tiny round clear vacuoles, which were colored by Sudan stains. Early forms of blood cells were numerous among the mature red cells in the lumens of blood vessels in the liver and other organs.

Case 5.—A full term female infant developed jaundice within twenty-four hours after birth. The red blood count was approximately 3,000,000. There were 29 erythroblasts per 100 white blood cells. The icteric index was 90. On the second day the saliva was blood tinged and blood was passed from the rectum. A transfusion of 50 c. c. of blood was given. Death occurred on the third day. At autopsy some icterus was evident. The liver had a yellowish tinge. Microscopically, the liver cells were vacuolated by fairly abundant stainable fat. Many islands of hematopoietic cells were present throughout the liver. Hemopoiesis was also evident in the spleen.

Case 6.—Baby A., female, was born to the mother of *Case 1* on January 8, 1942. Forty-eight hours after birth, the physical findings up to that time being that of a normal newborn, the skin appeared icteric. This discoloration increased in intensity, reaching a peak on the fifth day. On this fifth day baby began to draw its head back and was difficult to bend. A spinal puncture revealed only excess bile pigment in the fluid. Therapy was continued; that is, the administration of choline chloride, but was complemented by an Rh-negative blood transfusion. Icterus began to recede, but the red blood count began to drop. Twelve days after birth a second transfusion of 80 c. c. of Rh-negative blood was administered. Ten days later a third transfusion of Rh-negative blood was administered. Vitamin K was continually administered by mouth until the baby was one month of age. Reticulogen was administered daily by hypodermic after the baby's twentieth day of life. At one month of age the baby was clinically well, but choline was continued until six weeks of age, and the opisthotonus had completely disappeared: at four months of age the baby is well and developing satisfactorily, and the blood picture is normal. For further family history see *Case 1.*

Case 7.—Baby H., a small male, was born February 21, 1942. Examination revealed a slightly icteric skin and an enlarged spleen. Sepsis and syphilis being ruled out by laboratory analysis, a diagnosis of icterus gravis was made. Differential blood smear revealed 49 erythroblastic cells per 100 white cells and an icteric index of 200. Choline chloride was administered by mouth, liver extract by hypodermic. This baby's icteric index rose to 315 on the fifth day of life and by this time the red blood count had dropped to three million. Small transfusions were administered daily from the fourth day of life until the tenth day of life. The icteric index began to drop slowly. The general appearance improved. At five weeks of age the baby developed impetigo and an upper respiratory infection and died. The icteric index was 60 at this time. Family history in this case was essentially negative. There are two other living children. The mother bled considerably during pregnancy and as a result was anemic. Microscopic examination of organs removed at autopsy showed no evidence of extramedullary hematopoiesis. There was no lipoid accumulation in the liver (*Fig 5*)

SUMMARY

Evidence is presented that there is faulty fat metabolism in the liver in infants dying with icterus gravis. The prothrombin time in icterus gravis remains high throughout its course on ordinary treatment. The prothrombin time returned to normal in three cases with recovery from the disease without the complication of kernicterus. It appeared in these three cases that the rate of recovery was definitely accelerated by the administration of choline. A case so treated but not completely recovered died following the development of pneumonia. Although clinically typical, autopsy examination showed a normal liver and spleen, without fatty deposits.

Therefore, in conclusion, a diet of vegetable fat supplemented by labile methyl containing choline chloride, and labile methyl containing casein is indicated in the treatment of the faulty fat metabolism found in the liver dysfunction of the family tragedy, icterus gravis.

The authors are indebted to Mr. Robert Olson and Dr. W. H. Griffith, of the Department of Biochemistry, St. Louis University School of Medicine, for their interest and counsel in this study.

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AN ECLECTIC TECHNIC FOR INTRACAPSULAR EXTRACTION OF CATARACT*

By JOHN GREEN, M.D.
St. Louis, Missouri

For several years I have been interested in developing a technic for intracapsular cataract extraction in which each step should be capable of being carried out with precision. I have had in mind, also, the needs of the occasional operator whose cataract material is limited and who, therefore, is unable to acquire the skill and confidence of operators having at their command the abundant material of large metropolitan clinics. The procedure to be described cannot be performed in a hurry. I have never been attracted to any method of cataract extraction in which speed of execution is held to be important.

None of the steps in the procedure about to be described are original with me. In some respects the technic resembles that described by Voerhoeff.[1] Individual features of technics by other surgeons have been borrowed. The procedure might, therefore, be termed an "eclectic" technic for intracapsular extraction of cataract.

This communication is not concerned with the general examination of the cataract patient nor with indications for intracapsular extraction. It is to be assumed that the surgeon has satisfied himself that an intracapsular extraction is not only indicated but is probably feasible.

The steps in the procedure are as follows:

(1) Homatropin 3 per cent is instilled at 15-minute intervals beginning three quarters of an hour before the operation. Akinesia is obtained by the Van Lint method, using 2 c. c. of a 2 per cent procaine solution, 1 c. c. being injected into the orbicularis fibers of the upper lid, and 1 c. c. into the fibers of the lower lid. Immediately after this injection, two drops of 4 per cent solution of cocaine hydrochloride is instilled in the conjunctival sac. This is repeated once after an interval of one minute. Ten drops of a 4 per cent solution of protargol is now instilled. The speculum is then inserted, the conjunctiva grasped and lifted just below the corneal limbus at 6 o'clock, and 0.5 c. c. of 2 per cent procaine is injected subconjunctivally, using a one-inch 27-gauge needle. The speculum is then removed and with the eyes closed, the lids are gently massaged with a circular motion to promote distribution of the intramuscular and subconjunctival injections. The instillation of cocaine is now resumed, one drop at two-minute intervals for three more instillations. As a final step, the conjunctival sac is thoroughly irrigated with 2 per cent boric solution.

FORMATION OF THE FLAP

After insertion of the speculum, the conjunctiva is grasped at exactly 12 o'clock with a small single tooth fixation forceps (*Fig. 1*). The conjunctiva is nicked not more than 3 mm. from the corneal limbus and the incision is carried horizontally for about 4 mm. to right and left and then extended temporally and nasally concentric with the limbus to a full 180 degrees. The dissection should be carefully done, preferably with sharp pointed scissors and should include all possible subconjunctival tissue. To

*Read in General Clinical Session, Southern Medical Association, Thirty-Fifth Annual Meeting, St. Louis, Missouri, November 10-13, 1941.

1. A New Operation for Removing Cataracts with Their Capsules: Trans. Am. Ophthalm. Society, **25**:54-62, 1927.

avoid tearing, the conjunctiva should be grasped with toothless forceps (blunt pointed forceps with corrugated opposing grasping surfaces are best). At this point all bleeding should be checked by pressure with a sponge or by a cotton wound toothpick soaked in epinephrine 1:1,000. Occasionally a small episcleral vessel will continue to bleed in spite of these measures; if so, the bleeding can be checked quickly by touching the vessel with a silver probe which has been brought to a dull red heat in the flame of an alcohol lamp.

The flap thus prepared is stroked back to its original position (*Fig. 2*). This temporary replacement is for the purpose of bringing the edges of the incision into exact apposition as it is important that the two lateral sutures be accurately placed to avoid puckering. One suture is inserted in the edges of the flap at a position opposite 10 o'clock on the cornea. The other suture is placed on the opposite side at a point corresponding to 2 o'clock of the corneal limbus. These sutures are drawn through, are looped out of the way, and the ends are crossed. The central suture is passed through the conjunctiva adjacent to the cornea at precisely 12 o'clock. It is not entered through the upper flap. This suture is intended primarily for traction by the assistant after the incision is completed. The sutures are of 6-0 silk with swaged-on needles. At this point the conjunctival flap is stroked forward so as to reveal the corneoscleral sulcus throughout the whole extent of the dissection.

Fig. 1
Preformed incision. The incision nearest 12:00 o'clock should be nearer the limbus than depicted.

Fig. 2
Illustrates the insertion of the lateral and central sutures; the latter is used mainly for traction.

The globe is grasped just below the horizontal meridian with double fixation forceps (*Fig. 3*). The assistant makes traction forward on the central suture and the operator enters the point of the keratome in the sclera just back of the limbus. For greater accuracy and to promote the easy entrance of the point of the keratome, the line of the keratome incision may be slightly grooved for three or four millimeters with a scalpel or Lundsgaard knife. Before entering the keratome, the surgeon should make sure that the operating light is properly directed and that the iris border at 12 o'clock is visible. This may require, in addition to shifting the light, a slight change in the direction of traction by the assistant. The incision with the keratome should be made boldly, the incision being as wide as the angle of the cutting edges will permit. On

Fig. 3
Keratome incision. The keratome used is wider than the one depicted and is not thrust so far into the anterior chamber.

completing the section the keratome should be quickly withdrawn with the point pressed forward somewhat; the blade of the keratome should be withdrawn in a plane midway between the lens and the posterior surface of the cornea, thus avoiding injury either to the lens capsule or to Descemet's membrane. Should the iris prolapse following withdrawal of the keratome, it should be replaced with an iris repositor. Should hemorrhage occur and partly fill the chamber, it should be gently irrigated out with tepid normal saline solution.

The next step is the enlargement of the incision (*Fig. 4*). The conjunctival flap on one side of the incision is gently lifted with the corrugated forceps and the blade of a thin blunt pointed curved or angled scissors (those designed by Aebli are preferred) is insinuated into the angle of the chamber and by repeated small snips the incision is enlarged down to the horizontal meridian. Similar scissor cuts enlarge the incision on the opposite side. If there are any hemorrhagic spots or masses in the anterior chamber, they are gently irrigated out with normal saline solution.

The assistant now makes slight downward traction on the middle suture, the iris forceps is introduced, the iris grasped near the pupillary border, withdrawn and cut radially, the scissor blades resting on the everted central flap. At this point the angles of the coloboma should be inspected. If not in good position they should be replaced with an iris repositor.

We are now ready for the expression. The blunt tip of the half curved expression hook is placed on the cornea (not on the sclera) very near the lower limbus, and gentle pressure is exerted. The point is swept around the corneal limbus both to the right and to the left, making continuous gentle pressure with to-and-fro motions. At this point the assistant grasps the traction suture and by a slight pull downward everts the upper part of the cornea. The operator, continuing the to-and-fro pressure movements, watches carefully to note when the rounded equator of the lens begins to present in the wound (*Fig. 5*). At this moment the circular blade of Verhoeff's capsule forceps is gently insinuated behind the edge of the lens. The forceps are then closed, thus grasping the capsule at the equator of the lens. At no time should the semicircular sweeping pressure by the point of the hook be discontinued. Once grasped the lens is delivered by a continuation of pressure, the forceps serving mainly to steady the lens and to hold it back so that it is kept constantly in contact with the posterior lip of the incision. Traction on the lens should be very slight, although it is permissible to make small lateral motions to aid in the rupture of still holding zonular fibers. As the lens is emerging, the assistant lifts the speculum forward with one hand and with the other shields the eye from the glare of the operating light. The lateral sutures are tied. Any displacement of the angles of the coloboma is now rectified. The middle suture is inserted in the distal flap and tied.

The foregoing technic offers the following advantages.

(1) The conjunctival flap is precisely fash-

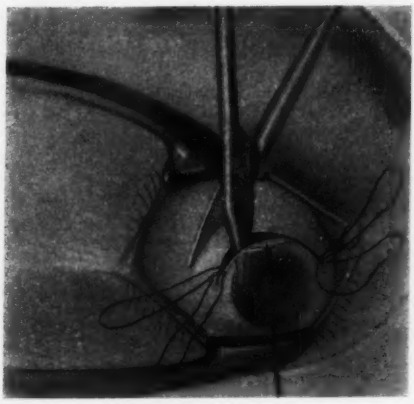

Fig. 4
Enlargement of the incision with blunt-pointed scissors.

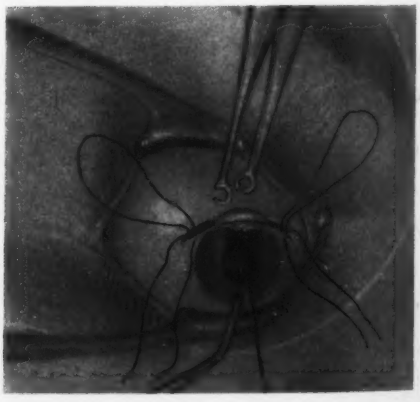

Fig. 5
Illustrates the early stages of expression. The forceps are applied to the equator of the lens just at the moment it presents in the wound and not (as shown in the drawing) after the lens has begun to emerge.

ioned, accurately placed and held in position by three sutures (two more can be inserted at the conclusion of the operation if desired); the complete coverage of the incision is a safeguard against infection.

2. The incision is made exactly where the surgeon desires and is in full view at every moment of the procedure. The lateral cuts made by the scissors are also accurately placed in the sclera.

(3) The iris is well seen at the time of the iridectomy.

(4) The traction suture is used (a) to display the iris; (b) to evert the cornea slightly during the early stages of the expression, thus enabling the surgeon to apply the capsule forceps accurately and at the right moment; and (c) to suture the middle portion of the flap.

(5) The steadying of the lens upward and backward, thus keeping it during delivery in apposition with the posterior lip of the incision and the release of pressure on the globe by lifting the speculum help to prevent loss of vitreous.

(6) The capsule is grasped not near the lower pole where the membrane is thinnest but at the equator where the fibers are thicker and tougher. According to the measurement of Salzmann, the thickest parts of the capsule, both posteriorly and anteriorly, are near the equator of the lens.

A TREATMENT FOR FRACTURED CLAVICLE BY TRACTION*

By FRED G. HODGSON, M.D.†
Atlanta, Georgia

This is not a treatment for all cases of fractured clavicle. The majority of cases, especially in children, can be handled satisfactorily by a much simpler method, and confinement in bed is not necessary. This method has proven very satisfactory, in case the patient is confined to bed with other injuries or shock. It is also very useful in young women who wish to get accurate reduction with no deformity. It also has the advantage that no anesthetic is required for reduction of the fracture. Very accurate reduction may be obtained and maintained. The patient is comfortable. Open operation may be avoided, and the wearing of a cumbersome brace or plaster cast is not necessary.

A bed is prepared by having a firm mattress with fracture board between mattress and springs. Both axillae are well padded with cotton, and a posterior figure-of-8 bandage applied to hold the shoulders back. The patient is put to bed on her back with a small pillow, 6x8 inches, under the dorsal spine. The head of the bed is raised by means of shock blocks or a plain chair. A muslin bandage about 4 inches wide is slipped under the figure-of-8 bandage at the affected shoulder. This is then pulled in an upward and outward direction and fastened to the head of the bed. An opiate or sleeping powder is given, depending upon the amount of pain present. The body tends to slip down in bed, especially when the patient is asleep. The traction of the body against the counter traction of the bandage attached to the head of the bed reduces the fracture, and maintains it in position. If pressure in the axilla is uncomfortable, the patient pushes up in the bed and the pressure is relieved. If more traction should be necessary to reduce the fracture a pulley can be fixed to the head of the bed, and a rope with weights attached passed through the pulley and fastened to the shoulder loop. The patient should be kept in bed 3 to 5 weeks, depending upon how soon the healing takes place as shown by the x-ray.

Fig. 1
Shows patient in bed with traction strap applied.

*Received for publication October 21, 1942.
†Professor Orthopedic Surgery, Emory University.

REPORT OF A CASE

Mrs. T. M., aged 30 years, was injured in an automobile wreck. She was taken to Emory University Hospital. She was in shock, suffering from multiple contusions, possible fractured ribs, and fracture of the left clavicle. She was put to bed and treated for shock. X-ray showed a fracture of the clavicle one inch from its outer end with marked displacement. A posterior figure-of-8 bandage with pads in axilla was put on. The next morning her condition was still poor, the fractured clavicle was still not reduced. An open operation was considered, but the patient objected to a scar on her shoulder. A muslin bandage was fastened to the bandage at the injured shoulder and the head of the bed raised. X-ray twenty-four hours later showed perfect reduction. After three weeks in bed, good callus was present. An up, out, back aluminum brace was worn for two weeks longer. The end result was perfectly satisfactory.

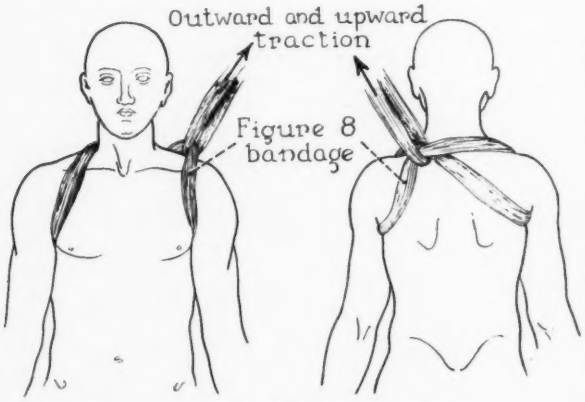

Fig. 2
Shows method of attaching strap to figure 8 bandage.

Conwell* has described a method of treating fractures of the clavicle by traction, but his method requires a special frame attached to the bed and is more complicated than this method. I have seen no other reference to this type of treatment.

*Key, J. Albert; and Conwell, H. Earle: The Management of Fractures, Dislocations, and Sprains. Third Edition, p. 489. St. Louis: C. V. Mosby Co., 1942.

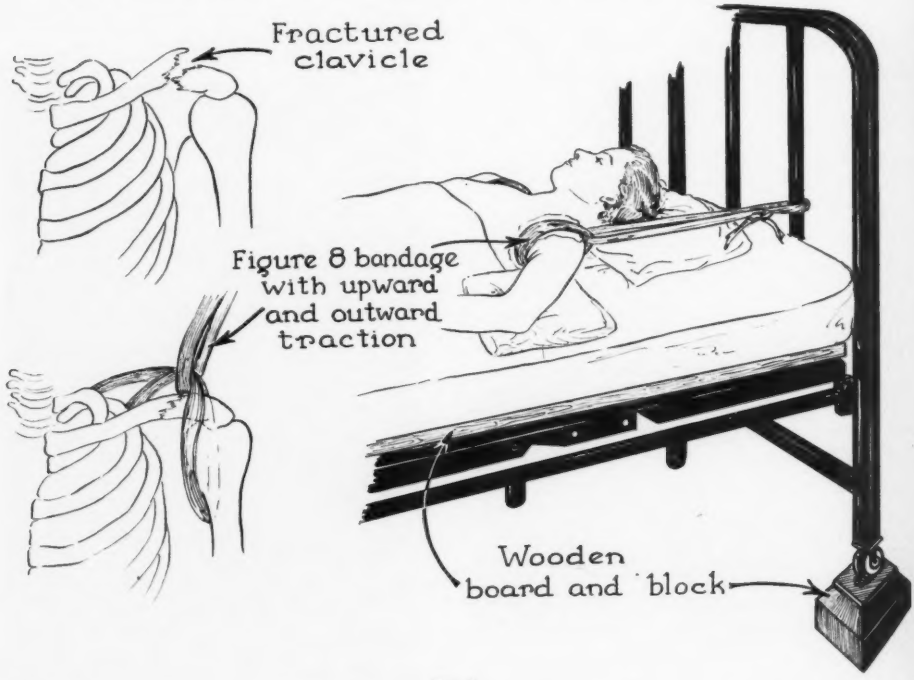

Fig. 3
Shows head of bed raised on blocks and board under mattress. Also tracing of x-rays taken before and after traction was applied.

HARDWARE STORE SURGICAL INSTRUMENTS*

By W. COMPERE BASOM, M.D.

and

LOUIS W. BRECK, M.D.
El Paso, Texas

For many years, surgeons have utilized hardware store instruments in operative work. In *Fig. 1* some of the instruments are shown which can be adapted for surgery and which were originally hardware instruments. The idea for using hand saws came originally from Dr. H. W. Meyerding. The use of the hand drill and hammer came from Dr. Sim Driver and Dr. P. M. Girard.

Many hardware instruments are mechanically sound and well made. In order to be adapted for surgical use they must withstand sterilization by the various popular means. They must be easily cleaned. Ordinarily the substitution of metal handles for those made of other materials

*Received for publication August 14, 1942.

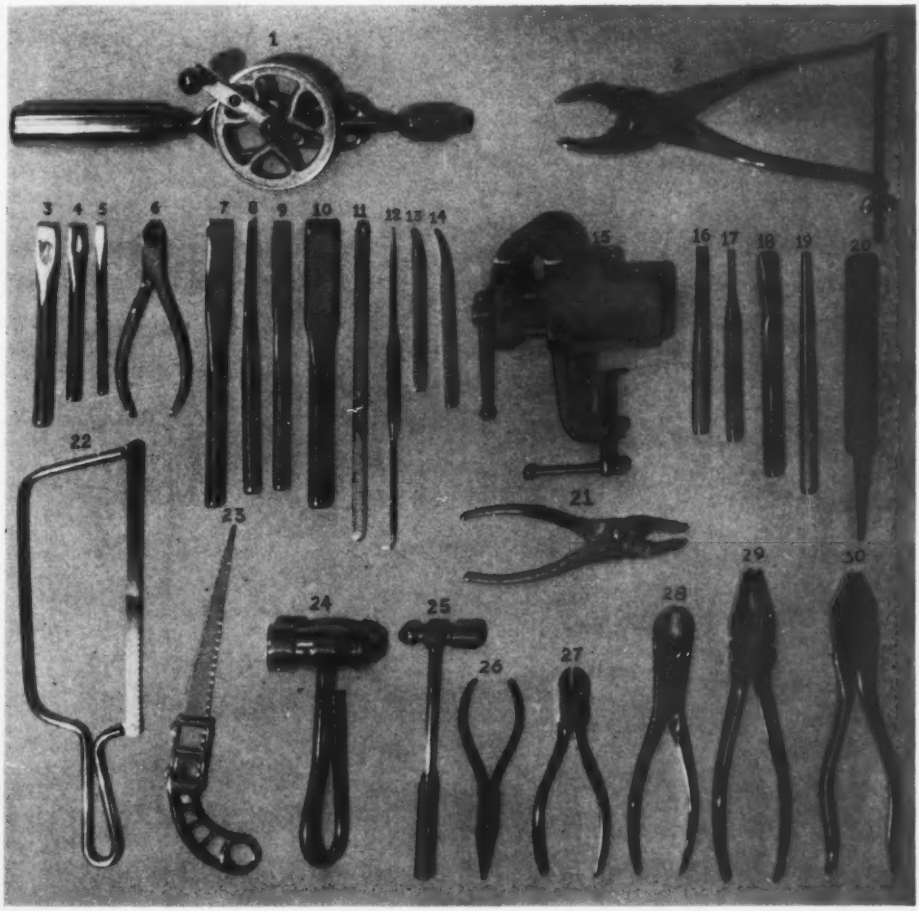

Fig. 1

1, Bone drill. 2, Self-retaining bone holder. 3, 4, 5, Chisels. 6, Bone biter (formerly a wire cutter which was ground down to proper size). 7, 8, 9, Osteotomes, which were made by grinding down a chisel as illustrated by 10. 11, Tendon passer. 12, Bone retractor. 13, 14, Chisels for facet fusion procedures. 15, Vise for holding bone grafts during milling. 16, 17, Gouges. 18, Periosteal elevator. 19, Impactor. 20, Rasp. 22, 23, Saws. 24, 25, Hammers. 21, 26, 27, 28, 29, 30, Pliers which are useful especially in procedures in which wire is used.

and the replacement of the usual finish by a good nickel plated surface produces a good surgical instrument as in the case of the hand drill, as illustrated. Some of the other instruments need grinding as the chisels, gouges, bone biter, periosteal elevator and osteotomes. These were entirely composed of metal and were ready for use after plating. The plating, incidentally, was first applied as a coat of copper and then a heavy coat of nickel was applied. This provides a more durable finish than nickel alone and is not so likely to chip off. The small bone biters were ground down from heavier wire cutters. The bone holder was made from a heavy pair of mechanic's pliers. The teeth were constructed by use of a small metal saw and a triangular file. The handles were heated and bent outward, then notched for the self-retaining bolt with a rat tailed file on the nut and with a saw on the hinged end.

The vise is used for holding a trochanteric angle bar when it must be bent and also for holding bone grafts which must be rounded or worked into shape.

The various pliers are likely to be useful during many operative procedures for instrument maintenance, twisting or cutting wires.

These instruments have proved to be efficient. They are inexpensive. However, some required much work before they were ready for surgical use.

CONCLUSION AND SUMMARY

It is possible to obtain many bone and joint surgical instruments from the hardware store. Examples are presented and discussed.

THE TREATMENT OF SLIPPED UPPER FEMORAL EPIPHYSES*

By W. K. West, M.D.
Oklahoma City, Oklahoma

Slipping of the upper femoral epiphyses is a relatively rare condition; but in large orthopedic centers, it is not considered a rarity. In our experience, practically all of these cases come in after the pathologic lesion is well advanced.

During the last eleven years at the State Crippled Children's Hospital of Oklahoma, 42 cases have been recorded. In not a single case have we made a diagnosis in the so-called preslipping stage. As a result of the type of cases admitted, this paper will deal largely with those with advanced deformities.

Five general methods of treatment have been carried out.

The groups are as follows:

(1) Cases in which the deformity is so slight that reduction is not necessary.

(2) Cases in which the deformity is mild and appears to be of recent origin.

(3) Those in which the deformities are further advanced and in which the union is more definite.

(4) Those in which the union is solid and the neck shows a typical torsion as a result of the malunion.

(5) Those in which the deformity is severe, solid, and has begun to show changes in the head or in the acetabulum, or both.

Since the case reports deal with the more severe type, no case reports will be presented in the first group.

In the second group, the first case is as follows:

Case 1.—G. W., a white boy, aged 15, obese, was admitted August 8, 1935, with a history of having fallen three months prior to admission. X-ray showed a moderately severe slipping of the head with resulting external rotation and limited flexion and abduction.

Under general anesthetic, a manipulation was done, and using gentle force, the hip deformity was reduced. A double hip spica was applied with the leg in abduction and internal rotation and slight flexion.

Plaster was worn three months, followed by physical therapy. Weight bearing was begun the fifth month.

Six years later, in October, 1941, he was examined, and the result found to be excellent. There was no evidence of arthritis; flexion was only slightly diminished; abduction was markedly diminished; and rotation moderately diminished. He reported that he had been drafted and examined one week before by the local board, and passed for full military duty. The board was advised later that it had evidently overlooked the true condition of this man's right hip, as in no one's judgment would he be able to go on the drill field without later showing up with a disability.

This case shows that in properly selected cases, manipulation and reduction can be carried out without later developing necrotic changes in the head due to excessive pressure.

In the third group, those with definite union at the site of deformity, and those in which the deformity is not too severe, open reduction by doing a simple osteotomy has generally been

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Thirty-Fifth Annual Meeting, St. Louis, Missouri, November 10-13, 1941.

employed following the experience of McMurray[1] of Liverpool.

Case 2.—W. W., a white boy, aged 14, very large and obese, with typical Frohlich syndrome, was admitted to the hospital in May, 1932, giving a history of having fallen from a bicycle 11 months before. X-ray showed moderately severe deformity with definite union at the epiphyseal line.

Under general anesthetic an open reduction was done, using a large curved wood carver's chisel for bone division. The deformity was then reduced by traction and internal rotation. Double hip spica was applied with leg in abduction, internal rotation and 20° flexion with a corresponding flexion of the knee. The patient remained in plaster three months, and was protected for three additional months.

Supplemental examination was done in February, 1939, approximately seven years after operation, and the x-ray showed the following: thickened neck; slightly widened head; deformity well corrected; no evidence of necrosis in the head or in the acetabulum. Flexion was exceptionally satisfactory, abduction limited, internal rotation limited. Disability was very slight.

The end result was considered to be excellent.

Case 3.—D. B., a white boy, aged 14, was admitted April 27, 1937. Ten months prior to his admission, the patient noticed a slight limp in the left leg with aching at night, and an occasional sharp pain. These remained essentially unchanged except possibly for a slight increase in the limp until the previous January, when he slipped and fell on ice. This caused an immediate increase in pain which the patient thought was in the knee. His leg was hot-packed for several days, followed by walking on crutches for three weeks, and then he resumed his school work. The pain and limp had persisted, worse since the fall. X-ray showed upper femoral epiphyseal deformity.

Open reduction was done May 13, 1937, twelve months from the original onset of pain in hip. A Smith-Petersen incision was made with sterile towel applied to skin edges. Dissection was carried down the sartorius of the rectus on the medial side and the extensor fascia lata of the gluteus on the lateral side to expose the capsule which was incised in the line of the neck and femur. With a large wood cutter chisel, the head was severed from the neck along the line of the epiphysis and by manipulation, reduction of the anterior angulation was accomplished. It was necessary to remove a portion of the anterior and inferior margin of the head of the femur. A double hip spica was applied to the leg in abduction and internal rotation, slight flexion.

Twenty months following operation, the following note was made: He walks with a slight limp, and has no trouble sitting down. The result is excellent.

July 25, 1941, motion in the left hip was better than the average postoperative epiphysitis case. Abduction was limited, rotation satisfactory, flexion good, and there was no pain in the hip. X-ray showed the neck to be thickened, but the bone structure normal.

He is going to the University and says that he has no disability.

Case 4.—H. L. V., a white boy, aged 13, was admitted May 10, 1941, giving a history of pain in the right knee for three months. He fell from a bicycle three months before, and had been walking on crutches since. One week earlier, he fell on the porch, which resulted in increased pain in the right knee. The x-ray showed upper epiphyseal deformity.

May 20, 1941, an incision 5 inches long was made, beginning at the anterior-superior spine. A Smith-Petersen type of dissection was done. The neck was found to be protruded directly upward with the head slipped posteriorly. Separation through a partial fracture line was made by periosteal elevator. No osteotomy was necessary. The head was then forced forward and the neck backward in order to engage the neck fragments directly into the raw head area. The leg was placed in position of extreme internal rotation and moderate abduction, slight flexion, and position was maintained by a double hip spica.

Plaster was removed September 26, 1941, followed by physical therapy and beginning weight bearing on crutches October 10, 1941.

This is not an end result. The case is simply presented to bring out the point that there is such a thing as a complete separation at the epiphyseal line, and on operation to find a condition that is somewhat similar to a true traumatic fracture of the neck of the femur.

Case 5.—E. R., a white boy, aged 14, was admitted May 28, 1940. Without history of injury of any kind, the boy started limping and complaining of the left leg 10 months earlier. At the present time he was improved as to pain. X-ray showed typical advanced slipping of the upper left femoral epiphysis.

June 4, 1940, an attempt at reduction under general anesthetic was unsatisfactory.

Operation November 12, 1940, consisted of osteotomy through the neck of the left femur.

Ten months later the following note was made: The patient walks with a moderate limp due to slight shortening and limitation of flexion of the left hip. External rotation has been corrected. Abduction is satisfactory. The case is improved, but not classed as good.

In this case, I am of the opinion that the limitation of motion, especially in flexion is due to the fact that the deformity was well advanced, plus a failure to place the leg in sufficient flexion, which in our opinion should be 20°.

GROUP 4

We now come to the discussion of the feasibility of the use of Smith-Petersen nails in the treatment of pathologic slipped epiphyses. According to McMurray, internal fixation is unnecessary if the osteotomy has been done correctly and the position of the fragments maintained properly.

In our opinion there is more danger of a de-

1. McMurray, T. P.: Slipping of the Upper Femoral Epiphysis and its Treatment. The Medical Press and Circular, **197**: 5189 (Oct.) 1938.

vitalized head following the use of a nail than in those in which a simple osteotomy has been done. The operation is also very much more difficult, as two incisions are necessary, and the introduction of a nail through the central portion of the neck of a child's femur is not easy. Neither is it simple to obtain an adequate hold on the head without danger of the nail's penetrating into the hip joint proper. This operation should certainly be done only by experienced orthopedic surgeons.

Occasionally, the acute condition results in the complete loss of continuity at the epiphyseal line, which can be demonstrated by the x-ray although the patient gives no history of injury whatever, and it has been a slowly progressive condition, as in the following case:

Case 6.—J. H., a colored boy, aged 11, was admitted February 21, 1941, giving a history that one year earlier he began having pain in the left hip and occasional limp. There was no history of specific injury. In August, 1940, pain became more severe and there was a more pronounced limp. Three weeks earlier, while walking down the road with his father, he suddenly had severe pain in the left hip, and fell. Severe pain disappeared one week following the injury, and since that time had become less.

This boy had a positive Wassermann and was diagnosed as a case of late congenital lues.

X-ray showed some absorption of the femoral neck. The film showed the femoral epiphysis to be partially slipped, the femoral neck lying superiorly.

March 13, 1941, under general anesthetic, a Steinmann pin was inserted through the distal left femur. The hip was manipulated to improve position and checked by x-ray. A plaster spica was applied just above the left knee with traction bars incorporated to allow application of elastic traction to maintain internal rotation. X-ray after traction showed marked improvement in the position of the head as regards the neck.

March 27, 1941, under an anesthetic, a small incision was made over the left hip, and after manipulation of the hip, a Smith-Petersen nail was inserted without difficulty to the neck and then to the head. X-ray taken on the table, anterior posterior and lateral positions, shows satisfactory reduction, location and position of the nail. A plaster boot was applied to prevent rotation.

The end result cannot be reported. The reason for the inclusion of the case is to show that there was a pathologic separation, and that the deformity was corrected beautifully by Steinmann pin traction and fixed definitely by using a Smith-Petersen nail somewhat similar to the method of treatment of traumatic fracture through the neck of the femur.

Case 7.—E. J. H., a colored girl, aged 12, was admitted May 9, 1941. The mother had noticed that the child had a limp one year before, with associated pain in the hip. This had become progressively worse until three months earlier she quit school. There was no history of trauma or infection previous to the illness.

X-ray showed marked bilateral slipped femoral epiphysis.

Treatment consisted of open reduction, May 29, 1941. A three-inch incision was made over the anterior aspect of the left thigh by the sartorius tensor fascia femoris. The capsule was exposed and opened. Head was found to be back and down, and a curved osteotomy was made through the neck with wedge anterior and superior. The head was partially reduced, and a Smith-Petersen nail was inserted through the lower trochanter region and at the neck. The leg was held in slight internal rotation and abduction. X-ray showed the nail to be driven too far into the head, and it was extracted sufficiently to just reach the articular cartilage of the head. A hip spica was applied.

An operation was done on the right hip, July 10, 1941, like that performed on the left six weeks before. A Smith-Petersen nail was used for fixation of the neck and head and a plaster spica applied from the axilla to the ankle. The limb was in full extension and neutral rotation.

Physical therapy was started August 4, 1941, and the patient was advised to begin walking on the hip six months after operation.

The end result is not known as yet, but to date the Smith-Petersen nails have been very efficiently introduced after a perfect reduction, and the prognosis looks very hopeful. This case is reported to bring out the feasibility of using Smith-Petersen nails in bilateral cases.

The third case to be reported in this group is one in which the deformity was very severe and had been progressively growing worse for two years.

Case 8.—B. D., a white girl, aged 12, was admitted August 1, 1938, giving the history of having had difficulty in walking for 2 years, since an injury sustained while playing basketball. She fell and a girl stepped on the back of her left knee. This knee had been painful since, but the chief cause of trouble was the left hip, which, however, had never been severe enough to cause her to go to bed.

Operation was done August 17, 1938. A curved incision entered the joint between the tensor fascia lata and the glutei. The capsule of the joint was incised longitudinally, the hip dislocated from the acetabulum and thoroughly inspected. An osteotomy was done just distal to the cap of the epiphysis, removing a wedge of bone outward. With great difficulty the fragments were properly aligned. A satisfactory position was obtained and Smith Petersen nail was used for internal fixation. Double hip spica was applied with the left leg in slight internal rotation and 35° abduction.

The Smith-Petersen nail was removed February 8, 1939, and the cast removed also at that time.

On August 21, 1940, the patient was admitted due to flexion contractures of the left hip. A supplemental tenotomy was done. There was marked limitation of motion in the hip. The result was poor.

This case demonstrates that the result, no matter what type of treatment, is influenced greatly by the extent of the deformity and the length of time that it has been present.

GROUP 5

In cases where the deformity is marked, the union is solid, the head is widened, and neck thickened, it is very difficult to obtain correction, and the increased trauma may possibly result in damage to the circulation of the head.

In our position, subtrochanteric osteotomy for correction of the internal rotation should be done for improvement of the coxa vara, thereby increasing the range of abduction.

Case 9.—L. R., a white boy, aged 15, obese, admitted on June 14, 1937. He had been adipose all of his life. About 3 years before, he began to notice some difficulty in motion of both hips, and began to limp, but the condition now was better than it had been.

Because of the fixed position of his deformities, and his extreme weight, he was sent home before any operative correction of his deformities was attempted. He was not seen for 3 years and returned walking with difficulty and sitting with some difficulty.

X-ray showed an old epiphyseal coxa vara, bilateral.

Operative correction on the left hip was done, the left hip being much worse than the right. December 3, 1940, an 8-inch incision was made in the midline of the lateral aspect of the left upper femur. The greater trochanter and proximal shaft were exposed subperiosteally. Using a wide osteotome, a transverse osteotomy cut was made just below the lesser trochanter. The position of the osteotomy was checked with bedside x-ray film. The osteotomy was then carried out. Just below the lesser trochanter the dislocation was placed into the position of abduction and internal rotation. Heavy chromic suture was used for internal fixation, and double hip spica with the leg in correction position.

July 18, 1941, the patient was walking much better. Abduction of the left leg was improved. Marked external rotation was corrected. He was walking without crutches. X-ray showed firm bony union.

In October, 1941, the x-ray showed solid bony union. Abduction is improved. The weight bearing line is straight, the patella being directly below the anterior-superior spine. Flexion is improving and the end result should be most satisfactory. The right hip has not been treated because the function is much better. No operative correction is anticipated.

Because of satisfactory results obtained in arthroplasties of the hip in older children, the following case is reported. The deformity was so severe that the head had begun to show evidences of necrotic changes. However, the end result to date is disappointing, and arthroplasties will probably be very rare in the future.

Case 10.—J. L., a white boy, aged 16, obese, was admitted August 6, 1940, giving the history that one year earlier he had slipped, fallen and struck his right hip on a concrete floor, had some pain in the hip joint and began to limp, but the pain did not continue. Six months later while running, his right hip gave way and he fell. Since that time the limp and pain in the hip had increased, and he had noticed some shortening and limitation of motion.

The diagnosis was marked deformity through the upper epiphyseal line.

At operation, the head appeared friable, but the cartilage was loose and there was doubt of the head's remaining alive with Smith-Petersen nailing. Therefore, excision of the head of the femur was done as follows: the Smith-Petersen approach on right hip was used. Dissection was carried out between the sartorius tensor fascia lata. The hip joint was exposed, but the long head of the rectus was divided and resected medially, stripping the anterior muscle from the attachment to the ilium. The capsule was opened by crucial incision. After studying the pathology, the head was removed and the neck replaced in the acetabulum. The hip was held in abduction and inward rotation. The hip spica was applied to the leg in wide abduction and internal rotation.

One year after operation, August 6, 1941, the patient complained of no pain. There was range of active motion except in abduction which was practically nil. The patient walked with a lurch. The x-ray showed thickening of the neck in the acetabulum. There was 1½ inches shortening of the right leg, and he is now wearing ¾-inch lift on sole. A reduction diet was prescribed.

The result is fair, due to shortening of the leg and instability.

SUMMARY

The treatment of slipped upper femoral epiphyses is far from satisfactory. The methods used by various orthopedic surgeons are usually better suited to the early cases than advanced ones.

In the writer's opinion, early cases are best treated by simple fixation and protection either by plaster or by the Thomas caliper walking splint. In those in which there is a freely movable head, it is safe to give an anesthetic and manipulation can be done without danger of damaging the head.

In the third group, where union has taken place, but the deformity is not too great, simple osteotomy with a large wood carver's chisel through the epiphyseal line, followed by proper protection, is the method of choice.

Skeletal traction prior to open reduction certainly has its place. Smith-Petersen nails may be used by experienced orthopedic surgeons, but this operation should never be used by the inexperienced. There is, in addition, danger of damage to the necrotic head, even though the operation has been done expertly. Arthroplasties in these cases should be done very rarely because of the shortening of the leg, instability, and possibility of a permanently painful hip.

"PENTOTHAL" SODIUM (SODIUM ETHYL THIOBARBITURATE), COMBINED ANESTHESIA*

By HAYWARD S. PHILLIPS, M.D.

and

LINUS J. MILLER, M.D.

Atlanta, Georgia

In presenting this paper, we wish to show the advantages of combining "pentothal" (sodium ethyl thiobarbiturate) with other anesthetic agents, particularly with cyclopropane. This will be brought out by comparing a series of major cases employing the combination method to a similar series of cases in which "pentothal" was the total anesthetic.

In the field of anesthesia the combination of agents is not a new idea. As early as 1866, Allis,[3] an American surgeon, recommended a new method of combining the use of various anesthetic agents. In 1880, Billroth[3] improved the "combined method" by introducing an anesthetic mixture of alcohol, chloroform, and ether, the once well known A. C. E. mixture. Gwathmey,[3] in 1910, introduced basal narcosis by the rectal injection of ether in oil, with the maintenance of surgical anesthesia by inhalations of ether or chloroform. In 1917, Eichholz[3] discovered tribromethyl alcohol and recommended its use by rectum as a basal narcotic, the anesthesia thus produced to be deepened and maintained by the inhalations of chloroform or ether. Lundy[3] suggested the term, "balanced anesthesia", and has long been an advocate of this principle, especially in the combination of regional with general anesthesia. In New England, Wiggin[10] is partial to the combination of spinal with cyclopropane. McCuskey[8] reports satisfactory results by combining abdominal, epidural, and subarachnoid blocks with cyclopropane. Tovell, in step with the Mayo group, finds that spinal combined with "pentothal" presents certain advantages over the use of either agent alone. Also, in this light, a favorable report on this method recently comes from Sibley,[12] of Roanoke, Virginia.

Every anesthetic agent has certain properties which are desirable, but unfortunately, also possesses certain features which are undesirable. The unwanted properties are most likely to present themselves when the drug is misapplied or is used in overdosage. This is particularly true of "pentothal".

Pentothal sodium possesses at least three characteristics which are desirable:[9] first, its ability to induce a narcotic state free of any excitement stage; second, its brief period of action; and third, its apparent power to prevent or allay emerging retching and vomiting. "Pentothal" is a potent drug and when excessive doses are given, unwanted reactions may overshadow its desirable features. Of major concern is the respiratory depression which is prone to occur.[5] If prolonged, the concomitant anoxemia causes secondary alterations in the cardiovascular system with a drop in blood pressure and acceleration of the pulse. Under these circumstances, a state of shock can be said to be imminent. Because of the accumulated effects manifested[4], tolerance to the drug lessens as the length of administration increases, so that overdosage may easily and inadvertently be given, frequently resulting in the patient's being returned to bed to languish in a degree of shock for an hour or more. Restorative measures are available but should not have to be resorted to. Paramount among its disadvantages is the apparent inability of pentothal to produce adequate relaxation of the abdominal musculature unless excessive, or near excessive, amounts are used, carrying the patient into dangerous depths of anesthesia.

From a similar point of view, cyclopropane exhibits certain properties which are desirable in an anesthetic. Among these are: (1) its controllability; (2) its anesthetic potency in high oxygen concentrations; (3) its ability to produce adequate abdominal relaxation; and (4) its rapid elimination when administration ceases. In overdosage, one of its chief toxic manifestations is the production of cardiac arrhythmia ranging in severity from ectopic beats to fatal ventricular fibrillation. Any depression of the respiratory mechanisms, however, is under the constant control of the anesthetist through the use of intermittent pressure on the breathing bag. Among the undesirable features may be cited: (1) an excitement stage during the induction (this may be insignificant in the majority of patients. Nevertheless, a definite group, even though properly premedicated, tends to develop excitement, which may be manifested as obvious agitation, or merely, as a transient rise in blood pressure); (2) a period of retching, or retching and vomiting, occurs during emergence in from 40 to 50 per cent of patients.

*Read in Section on Anesthesia, Southern Medical Association, Thirty-Fifth Annual Meeting, St. Louis, Missouri, November 10-13, 1941.

This is more often seen in those cases of long duration, or where profound anesthesia has been necessary.

By combining "pentothal" and cyclopropane,[1 6] a "balanced anesthesia" results, and the desirable properties of each can be retained to the exclusion of those which are undesirable. By using "pentothal," an induction is available with a minimum of psychic trauma. Maintenance with cyclopropane assures a high oxygen concentration, and adequate relaxation can be obtained without marked alterations in the patient's physiology. A quick recovery period is the rule, free from any retching or vomiting. The two agents, in combination, seem to have a synergistic action and a smaller dose of each is employed than is the case where they are used alone.

The technic, in brief, is as follows: All cases, except spinals, are induced with a 2.5 per cent solution of pentothal sodium before starting any other procedure. Then, in case a general anesthetic, such as cyclopropane or nitrous oxide, is to be combined with the pentothal, maintenance is carried on by use of either or both of the agents, depending on the degree of relaxation or the depth of anesthesia desired. In case a local or regional is to be combined with "pentothal" the procedure is carried out after induction, and maintenance with "pentothal" is continued. At the point in the completion of the operation, when the peritoneum is closed, the combined agent is removed and, as is necessary, additional "pentothal" is given until the skin sutures have been completed. The patient should have completely emerged from the general agent by this time and the effect of the "pentothal" should carry the patient through the emergent retching and vomiting stage, permitting a quiet awakening within 20 to 30 minutes. Physiologic saline and a 5 per cent glucose solution is usually started at the beginning and continued throughout the operation.

A rapid induction, free of psychic trauma, has many advantages. To the patient it is a welcome change from the methods in which he must inhale vapors of objectionable odor, or undergo the dread period of a sense of suffocation before "going to sleep." The patient's gratitude for the induction afforded by "pentothal" is expressed only in superlatives. To the anesthetist, the rapid induction is appreciated because it cuts short one of the danger zones of the entire course of anesthesia. During an induction in which excitement develops, the nervous system is thrown into a hypersensitive state, adrenalin is released into the blood stream and the stage is set for an abnormal response to any pain stimulus, which may be in the form of ventricular fibrillation. For the surgeon, a rapid induction obviously reduces to a minimum any delay in starting the operation.

The maintenance period of any anesthesia has many pitfalls. The character of this period depends to a marked degree on what has gone before, namely, the premedication of the patient and the nature of his induction. It also depends on the physical state of the patient in relation to the severity of the operative procedure. If the depth of anesthesia is varied during the operative period to conform with the amount of trauma, a longer time elapses before signs of shock will appear. The deeper planes of anesthesia are usually necessary only during the opening of the abdominal cavity and visualization, and during closure of the peritoneum. The method employed should be the one which best suits the particular case, and which can be quickly varied at will to take care of all eventualities. With the combination of pentothal and cyclopropane, the anesthetist can obtain for the surgeon the desired degree of abdominal relaxation. This shortens the average operative time; likewise, it lessens the period of anesthesia.

We feel that a quick recovery period is of major importance and is advantageous for several reasons. It relieves the anxiety of the patient's family, an important phase of any operation. It lessens the necessity of administering stimulants, or of instituting measures to counteract shock. Convalescence begins 12 to 24 hours earlier, and the anesthetist knows that his patient has been left in full control of vital reflexes so that constant nursing care, which is often inadequate, is unnecessary.

By combining "pentothal" sodium with spinal anesthesia,[2 7 10 11] there is an entirely new picture as compared with the use of spinal alone. After the spinal anesthetic has been administered, the patient is given enough "pentothal" to produce sleep. In producing sleep, the patient is relieved of the psychological reactions he might have experienced of feeling his body paralyzed to the waist line, and hearing noises and conversation in the operating room. The traction on the peritoneum and mesentery invariably produces nausea, but with "pentothal" this is entirely alleviated. The cold, clammy skin resulting from the nausea reflex is rarely

seen. Strange to say, the drop in the blood pressure is not so marked when "pentothal" is used in combination with spinal. At the completion of the operation, the patient is given 50 to 100 milligrams of "pentothal" which will keep him asleep for 20 to 30 minutes after he has been returned to bed. These patients have a much smoother convalescence.

If it were not for the patient's sensations during the operative procedure, anesthesia would not be necessary. Therefore in those cases where another general agent in combination with "pentothal" is not feasible, as in neurosurgical cases, we find that local infiltration of the scalp, in craniotomies, or of the skin and subcutaneous tissues in other procedures, cuts the dose of "pentothal" to an average of about one-half. The same principle is applicable in other combinations such as abdominal block,[7 8] especially in upper abdominal work. It is most applicable in the regional, such as brachial plexus and transsacral. We prefer using procaine with cobefrin in producing the regional or block anesthesia, because the transient rise in blood pressure and pulse rate is not so marked as when epinephrine or ephedrine is used for the vasoconstrictor action.

We have collected a series of 520 cases, 330 of which were given combined anesthesia, and 190 were administered "pentothal" alone. Of those which received a balanced anesthesia, 93.13 per cent were majors, while only 63.5 per cent of the pentothal cases were majors. This difference is due to the fact that we continue to use "pentothal" alone for the majority of minor procedures, reserving the combined method for major operations and for those patients who, for one reason or another, are considered below the average surgical risk.

In the group of cases receiving "pentothal" alone, six patients, or 3.2 per cent, were considered to be below the average surgical risk: three of these were aged patients, two were ruptured ectopic pregnancies in shock, and one was asthmatic. Premedication varied, but an attempt was made to meet the metabolic rate so that the patient would arrive in the operating room conscious, but quiet and unapprehensive. Induction was smooth in all cases, although some patients were found to be resistant and the induction dose was necessarily larger. The anesthetic course was unsatisfactory in six, or 3.2 per cent of the cases: the complicating factors were: depressed respiration in three cases, hiccoughs in one, and aspiration of mucus with cyanosis in two. "Coramine" or metrazol was given during or immediately after the operation one or more times in fifteen, or 7.8 per cent, of the cases. The dosage of "pentothal" in those cases lasting over 30 minutes averaged 1,150 milligrams, and the reaction time averaged 45 minutes. Postoperative vomiting of more than one time occurred in 28, or 15 per cent, of the series, and was severe in three, or 1.6 per cent, of the cases. One patient developed pneumonia on the fifteenth postoperative day, and there were no deaths.

In those cases in which a combination of agents was employed, seventeen patients, or 5.3 per cent, were considered below the average surgical risk: seven were aged patients, four were anemic, two were obese, one was diabetic, one was an ectopic in shock, and one was asthmatic. Here again, premedication varied, but a majority of patients were quiet when brought to the operating room. Induction was satisfactory and free of any excitement in all cases. The anesthetic course was considered unsatisfactory in eight, or 4.01 per cent, of the cases. There were three cases of laryngospasm, three cases of hiccoughing, and two cases which developed mucus. Coramine was administered in one case. The average dose of pentothal in those cases lasting longer than 30 minutes was 575 milligrams, and the reaction time averaged 25 minutes. Postoperative vomiting occurred more than one time in thirty-eight, or 16.7 per cent, of the patients, and was severe in six, or 2.6 per cent. Postoperative complications occurred three times; one patient who developed hiccoughs during the operation was not relieved until the sixth postoperative day; and one patient developed a massive atelectasis on the third postoperative day; one developed pneumonia. Deaths numbered four: one was the atelectasis just mentioned, another the pneumonia, one died from postoperative hemorrhage following transurethral resection, and one developed a coronary occlusion on the twenty-first postoperative day.

Of the various combinations employed, "pentothal" and cyclopropane were used in 215 cases, "pentothal" and nitrous oxide in 62 cases, "pentothal" and ether in 8 cases, "pentothal" and cyclopropane plus abdominal block were employed in four occasions, "pentothal" and spinal were used in 16 cases, "pentothal" was combined with transsacral block in 14 cases, and abdominal block plus "pentothal" was used in 6 cases, brachial plexus block and "pentothal" in 2 cases, and "pentothal" with local infiltration of 1 per cent procaine in seven.

A group of similar operative cases has been chosen in order better to show a comparison between the two methods of anesthesia. A comparison has been made between the age of the patient, the time of the anesthesia, the dosage of "pentothal," and the reaction time. Six slides have been prepared which reveal these figures.

The first shows a comparison of the gynecologic cases. There were 96 cases in which a combined anesthesia was used, and 39 in which "pentothal" was used alone. It will be seen that the age grouping is very similar, as in the average anesthesia time. The dose of pentothal used in the combined group is about one-half that used in those cases receiving "pentothal" alone. The average reaction time is less in the former group.

GYNECOLOGIC

	"Pentothal" Combined 96 Cases		"Pentothal" 39 Cases
Age (Years)	36.6	Average	31.4
	18	Youngest	15
	70	Oldest	52
Dosage (Mg.)	600	Average	1,185
	275	Smallest	700
	1,375	Largest	2,325
Anesthetic Time (Min.)	83.6	Average	71.4
	34	Shortest	28
	180	Longest	180
Reaction Time (Min.)	31.0	Average	54.1
	To Bed	Shortest	15
	130	Longest	280

Table 1

APPENDECTOMIES

	"Pentothal" Combined 88 Cases		"Pentothal" 44 Cases
Age (Years)	23.8	Average	28.4
	9	Youngest	12
	53	Oldest	75
Dosage (Mg.)	536	Average	1,055
	200	Smallest	400
	1,000	Largest	2,000
Anesthetic Time (Min.)	44.6	Average	42.8
	17	Shortest	20
	85	Longest	80
Reaction Time (Min.)	25	Average	46.4
	To Bed	Shortest	To Bed
	210	Longest	240

Table 2

A comparison of the appendectomies shows a similarity in the age grouping, and the anesthesia time in both were approximately the same. The "pentothal" dosage and reaction time is about one-half in those cases receiving a combined anesthesia.

In the group on genito-urinary operations, the average age of the patients receiving a combined anesthesia was about 5 years above that of those receiving "pentothal" alone. "Pentothal" dosage and reaction time were similar in the two groups, but it should be noted that the operative procedures in which a combination was employed were of a more serious nature, consuming on the average better than one and one-half time the time of the "pentothal" cases.

GENITO-URINARY—KIDNEY

	"Pentothal" Combined 49 Cases		"Pentothal" 12 Cases
Age (Years)	41.5	Average	36.5
	16	Youngest	22
	72	Oldest	75
Dosage (Mg.)	571	Average	779
	350	Smallest	125
	1,000	Largest	1,500
Anesthetic Time (Min.)	68.8	Average	44.4
	36	Shortest	23
	100	Longest	135
Reaction Time (Min.)	22	Average	22
	To Bed	Shortest	To Bed
	180	Longest	90

Table 3

ORTHOPEDICS

	"Pentothal" Combined 22 Cases		"Pentothal" 15 Cases
Age (Years)	23.3	Average	36.3
	16	Youngest	15
	35	Oldest	81
Dosage (Mg.)	483	Average	1,093.6
	300	Smallest	375
	750	Largest	1,850
Anesthetic Time (Min.)	63.5	Average	62.6
	30	Shortest	40
	113	Longest	180
Reaction Time (Min.)	9.5	Average	27.3
	In O.R.	Shortest	In O.R.
	60	Longest	80

Table 4

In the orthopedic series, although the average age of the patient was younger in the combined group, and the anesthetic time was practically the same, the "pentothal" dosage was less than one-half and the reaction time was about one-third.

In the hernia group, the average age of patients was 5 years more in those receiving a combination of agents, and the average anesthetic time was longer by 43 minutes. However, both "pentothal" dosage and reaction time were appreciably decreased.

In those cases in which gastro-intestinal work was done, the more serious operations fall into the combined group, but the pentothal dosage and reaction time were both reduced.

HERNIORRHAPHIES

	"Pentothal" Combined 9 Cases		"Pentothal" 5 Cases
Age	35.7	Average	30.6
(Years)	20	Youngest	19
	58	Oldest	57
Dosage	739	Average	1,035
(Mg.)	350	Smallest	800
	1,000	Largest	2,000
Anesthetic	100	Average	57.2
Time	65	Shortest	40
(Min.)	155	Longest	75
Reaction	28.5	Average	81
Time	To Bed	Shortest	40
(Min.)	90	Longest	120

Table 5

GASTRO-INTESTINAL

	"Pentothal" Combined 15 Cases		"Pentothal" 6 Cases
Age	50	Average	47
(Years)	17	Youngest	24
	73	Oldest	78
Dosage	690	Average	1,375
(Mg.)	325	Smallest	350
	1,325	Largest	2,500
Anesthetic	94.7	Average	69.3
Time	48	Shortest	36
(Min.)	150	Longest	125
Reaction	34	Average	39.1
Time	To Bed	Shortest	10
(Min.)	100	Longest	65

Table 6

In conclusion, it is our opinion that the use of "pentothal" sodium in combination with cyclopropane or other agents and procedures affords a much wider field of usefulness than when it is used alone, for the following reasons:

(1) Because a balanced anesthetic is produced with an induction free of excitement.

(2) It provides a maintenance period which is easily controlled and can be quickly varied.

(3) The recovery period is shortened and is free of emergent retching and vomiting.

(4) And, finally, because the combined method avoids the larger undesirable dosage of each agent that is necessary when either is used alone, thus allowing an earlier and safer convalescence for the patient.

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DISCUSSION (*Abstract*)

Dr. Merrill C. Beck, New Orleans, La.—"Pentothal" induction is definitely pleasant for the patient, easy for the anesthetist, and pleases the surgeon because of its rapid action.

It is particularly desirable when cyclopropane is the supplementary agent. Not only does this method allow the use of less concentrated mixtures, thus decreasing the incidence of cardiac arrythmias, but "pentothal" protects the heart from irregularities in the presence of high concentrations of cyclopropane.

Our group has not used this method as a routine procedure. However, we are using more "pentothal"

each month, and possibly in the near future will induce all patients with it.

At the present we use it to induce patients who have not had the advantage of premedication; to supplement cyclopropane when adequate relaxation is not obtained; to relieve the nausea complicating spinal analgesia; to supplement spinal analgesia when sensation returns before the end of the operation; and for various minor surgical procedures.

We administer a rather large dose for induction of the unpremedicated patient; usually one gram or nearly a gram. This dose is tolerated well if given slowly and its effect apparently lasts the duration of the operation.

On only one count do I disagree with the authors. They intimate that fatal ventricular fibrillation is not an infrequent toxic manifestation of overdose or high concentrations of cyclopropane. Our group is in the habit of obtaining relaxation with cyclopropane by using concentrations which carry the patients well past respiratory arrest, and we have never had the misfortune to encounter ventricular fibrillation. For this reason we feel that its occurrence is very rare.

Dr. Ralph M. Tovell, Hartford, Conn.—There are ways in which explosions can be prevented. One, for instance, is to eliminate sources of ignition, such as controlling electric power circuits by seeing that they are adequately protected by proper wiring that meets the National Electrical Code Standards. The other is to control static electricity. That is probably a little more intangible, a little more difficult to do, but ways and means are being devised.

There is also the hazard of spontaneous combustion. It was thought there was little reason to believe that spontaneous combustion could occur with inhalation agents, but I was rather disturbed to see Mr. Jones, of the Bureau of Mines, at Boston, put a little ether in an apparatus similar to a bicycle pump. The cylinder was transparent. He pushed the piston down, and without other source of ignition, other than the pressure itself, the ether did burst into flame.

We can use inhalation agents in non-explosive mixtures, but it is usually necessary to pass in and out of an explosive range at some point during the anesthesia. We have no indicators to show us definitely that we are either in or out of an explosive concentration. There is necessity for developing quenching devices, whether they be chemical or mechanical.

Another field for the prevention of explosion is the production of new non-explosive agents for inhalation. I would, however, like to refer to one old combination that might be mentioned: 50 per cent nitrous oxide, 50 per cent oxygen combined with the administration of "pentothal," would obviate the necessity for cyanosis that would otherwise appear with the administration of nitrous oxide alone where a hot body of one sort or another is to be used at the time of operation.

The judicious choice of agents administered by methods other than inhalation has not been sufficiently stressed.

Inhalation was used in 88 per cent of anesthetic procedures at the Hartford Hospital in 1936, whereas in 1941 there has been a steady decrease to only 54 per cent.

"Pentothal" anesthesia has frequently been combined with regional anesthesia, and you may note the increase of regional, which does not, of course, introduce this hazard. "Pentothal" has increased from 0.4 per cent to 24.9 per cent in 1941. I think that there is a real place for combination of "pentothal" with other methods that will reduce this hazard.

Dr. Phillips (closing).—At some of our hospitals they do not permit the use of explosive gases, and consequently we have to resort to the use of non-explosive gases such as nitrous oxide which has proven very satisfactory. Also, the combination with regional and with spinal.

EMERGENCY VEIN*

By MALCOM E. PHELPS, M.D.
El Reno, Oklahoma

Intravenous medication is frequently a life saving procedure. A venipuncture in the average individual is performed easily and safely providing a few basic precautions are observed. However, all physicians at times are confronted with an emergency where this procedure is difficult or impossible. These instances are probably encountered more frequently in treating the casualties of war both on the battlefield and in the civilian population which may be subjected to bombings, fires and other disasters that are concomitant with war.

Since the casualties on the battlefield are all male patients, intravenous medication or infusions can, if necessary, be administered through the corpus cavernosum of the penis. The availability of this puncture site is not generally recognized among the profession, although it is frequently a life saving procedure.

Shaw[1] in the *Journal of the American Medical Association,* February 11, 1928, first described this procedure. Strain[2] in the *Lancet,* January 10 of this year, again mentions its possibilities.

The technic is essentially as follows: a site is selected over the corpus cavernosum. While holding the penis firmly, the needle is inserted obliquely through the skin, the fascia (Buck's fascia) into the corpus cavernosum which is composed of venous spaces. The point of the needle should be directed toward the base. Ordinarily blood cannot be aspirated when the needle is in place. With a little care there is no danger of puncturing the urethra or the dorsal vessels of the penis. Slightly more pressure is needed for the injection than in the ordinary intravenous infusions due to the re-

*Received for publication August 24, 1942.

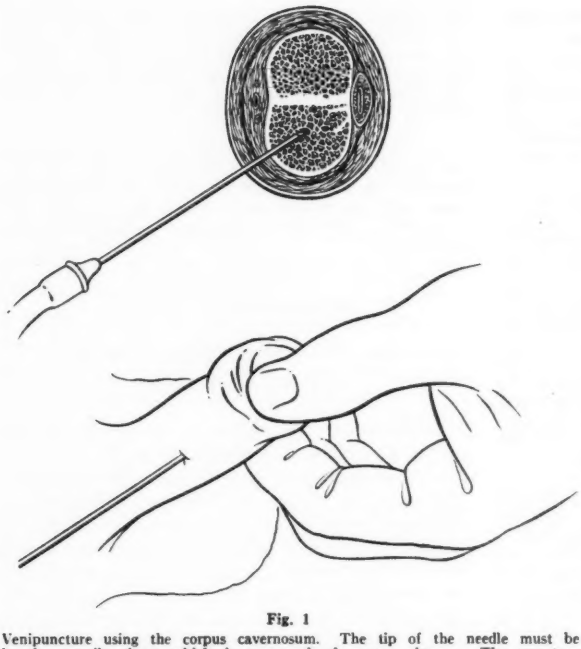

Fig. 1

Venipuncture using the corpus cavernosum. The tip of the needle must be in the erectile tissue which is composed of venous sinuses. The puncture site should be on the lateral surface where there is no danger of injuring the urethra or dorsal vessels. While the needle may be inserted as shown, it is satisfactory and more convenient for the needle to be directed toward the base of the penis.

sistance of the fibromuscular tissue, but the rate of flow of the injection may be as rapid as is safe in other intravenous routes. Irritating solution should not be used because of the risk of a chronic cavernositis, but this method is ideal for both blood plasma and citrated blood.

Following are cases in which this method was life saving.

Case 1.—In 1930, I was called to see a rather obese individual who had had a tonsillectomy 12 hours earlier. Following this, he had continued to bleed although he had been returned to the operating room two times and attempts had been made to control the hemorrhage. A donor was obtained, but repeated attempts at venipuncture failed because of a collapse of the circulation. As a last resort the needle was inserted into the corpus cavernosum and 500 c. c. of citrated blood was given by the gravity method. Following this the bleeding stopped and the patient recovered.

Case 2.—A 12-day-old baby was brought to the hospital with tetanus neonatorum. It was in a state of almost constant tonic convulsions and very cyanotic due to the spasm of the respiratory muscles. We were unable to puncture a vein even after giving the child the usual sedatives. The corpus cavernosum was punctured and 20,000 units of anti-tetanus serum was administered in this manner, with subsequent recovery.

Case 3.—A 13-year-old boy was brought to the hospital following a gasoline explosion. He had suffered extensive burns on the face, neck, both arms and both legs. Due to the burn we were unable to find a vein and on three occasions blood plasma was administered through the corpus cavernosum of the penis without any apparent ill effect.

In none of the above instances did swelling of any consequence or any bleeding follow the puncture.

SUMMARY

The corpus cavernosum of the penis is an easily available site in the male patient for emergency transfusions of blood or blood plasma. Repeated punctures are possible.

This route is not recommended if the subcutaneous veins are accessible, nor is it recommended for any solution except blood plasma or citrated blood.

Although the field is limited, it is encouraging to know that there is always an "available vein."

This should be especially valuable in the emergency treatment of wartime injuries, as it could be safely done by a trained assistant on the battlefield.

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LYMPHOPATHIA VENEREUM, AUTOSERUM AS SPECIFIC ANTIGEN*

By MARK M. MARKS, M.D.
Kansas City, Missouri

The virus of lymphopathia venereum usually causes first a herpetiform genital lesion[1] from which systemic infection spreads, so that secondary granulomatous manifestations develop in distant portions of the body.[2] The causative virus is lymphotrophic.

The sufferer rarely seeks medical aid during the primary phase but waits until involvement has progressed so as to interfere with bodily

*Received for publication June 8, 1942.

function. The commonest manifestation in the male is periadenitis of the inguinal glands, while in the female it is vulvar, anal or anorectal ulceration with the formation of scar and stricture. The cervix and intestinal tract may also become involved, as well as the eye,[3] lips, pharynx,[4] and axillary lymph nodes.

The Frei test detects cutaneous hypersensitivity to the specific antigen.[5] In the gross lesion, local sensitivity is continuously high so that inflammation is chronic and progressive. There follows, therefore, rapid cellular proliferation, pressure, and necrosis. Due to interference with lymph circulation, cellular metabolism is impaired. Histologic response comprises infiltration with fibroblasts and formation of giant cells, the inflammatory tissue later becoming interspaced with multiple stellate abscesses.

Treatment of lymphopathia venereum has taken many forms. Chemical,[6 7] physical,[8 9 10] surgical,[11 12] and biological[13 14 15] approaches have been tried with variously beneficial effects. Of all the chemical agents used, the sulfonamides have greatest value.[16 17 18] Roentgen therapy and deep diathermy have also been advocated but possess limited practicability. Surgery is applicable less for cure than for dealing with complications of this disease, to drain abscesses and to relieve visceral obstruction.

Intravenous and intracutaneous administration of specific antigenic material has yielded good and consistent results. This fact indicates that a systemic reaction is required if beneficial results upon the gross lesion are to be obtained. However, both of these forms of antigenic therapy have their drawbacks. Intravenous medication requires hospital supervision and constant care because of the severe febrile reaction. Intracutaneous therapy is expensive and frequently painful and disfiguring. A simple and inexpensive form of antigenic therapy is needed for the general use of physicians who may or may not possess special equipment or training.

POSSIBLE UTILITY OF AUTOSERUM

Several facts have long been known indicating the possible use of autoserum. Those who treat lymphopathia venereum observe that patients receiving the Frei test, either intracutaneously or intravenously,[19] experience transitory improvement in the severity of their symptoms. In rectal stricture the pain and persistent sense of pressure are alleviated. In inguinal involvement swelling diminishes. All other gross lesions respond similarly. Furthermore, the disease may be self-limited[20] without medical treatment. In inguinal adenitis, after a protracted period of sloughing and seropurulent discharge, spontaneous healing takes place. Many cases of rectal stricture have slowly stopped draining and have eventuated in a smooth, scarred, inelastic tube. Vulvar elephantiasis with ulceration (estheomene) may, after many years, heal with a smooth, depigmented scar. In these cases the body has manifested an ability to develop sufficient defense or antibodies to neutralize the effect of the virus and also to enable involved tissues to become circumscribed and to undergo repair. Despite these apparent cures, hypersensitivity to the specific antigen persists throughout life.

Antigen for testing and treating this disease has come from two main sources, human and animal. Human antigen can be obtained in three ways, from (1) an unruptured fluctuant bubo, (2) the seropurulent drainage from a fistulous tract, and (3) the tissue juices expressed from the inflammatory lesion. Material derived from these sources is limited in quantity and widely variable in antigenic content. Commercial antigen is made from mouse brain or more recently from chick embryo. Its cost may be a deterrent in its use as therapeutic material.

Like other virus infections, lymphopathia venereum, soon after its initial invasion of the host, spreads to all of the tissues of the body and provokes pathologic changes in isolated parts of the individual. Hypersensitivity can be demonstrated in any infected person by performing a Frei test, to which any portion of the skin reacts, regardless of where the major lesion may be. The presence of the virus in the spinal fluid, spleen, liver, kidneys, bone marrow and blood of monkeys was proved by Levaditi and his co-workers in 1932.[21] Much antigen can be derived from the region of greatest virus activity, and all other tissues of the infected person should contain some antigen. I judged that antigen must also be present in the circulating tissues as well as the fixed tissues of all organs.

DEMONSTRATION OF ANTIGEN IN BLOOD

In order to demonstrate the presence of the antigen in human blood, I first used blood-free serum, prepared from cases* of known infection, as a source of skin testing material. Intracutaneous tests with this substance proved to be negative because, as was later learned, of the extreme dilution of antigen in human blood.

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*All cases in this report were Negroes.

LYMPHOPATHIA VENEREUM IN THE FEMALE TREATED WITH AUTOSERUM WITH IMPROVEMENT

Case Number	Age	Involvement	Duration	Syphilis
1	28	Rectal stricture	3 years	no
2	40	Rectal stricture	6 years	no
3	20	Rectal stricture	1 year	no
4	42	Rectal stricture	2 years	no
5	53	Rectal stricture	3 years	yes
6	54	Rectal stricture	10 years	yes
7	57	Rectal stricture	20 years	yes
8	35	Rectal stricture	5 years	no
9	54	Rectal stricture	10 years	yes
10	29	Rectal stricture	2½ years	no
11	25	Rectal stricture	1 year	yes
12	45	Rectal stricture	3 years	yes
13	35	Rectal stricture	2 years	no
14	40	Rectal stricture, recto-vaginal fistula	4 years	no
15	34	Rectal stricture, recto-vaginal fistula	3 years	no
16	36	Rectal stricture	3 years	no
17	19	Proctitis	1 year	yes
18	52	Rectal stricture	10 years	yes
19	37	Rectal stricture	5 years	yes
20	36	Rectal stricture	5 years	no
21	23	Rectal stricture	5 years	no
22	27	Proctitis	2 years	yes
23	35	Rectal stricture	6 years	no
24	23	Rectal stricture	2½ years	yes
25	37	Proctitis	1 year	yes
26	30	Rectal stricture, recto-vaginal fistula	3 years	no
27	47	Rectal stricture	4 years	yes
28	39	Rectal stricture	3 years	no
29	47	Rectal stricture	2 years	yes
30	41	Rectal stricture	15 years	no
31	63	Rectal stricture	20 years	no
32	45	Rectal stricture, recto-vaginal fistula	8 years	yes
33	45	Rectal stricture	2 years	no
34	59	Rectal stricture	32 years	yes
35	15	Labial ulceration	1 month	no
36	40	Rectal stricture	6 years	no
37	42	Rectal stricture	10 years	no
38	50	Rectal stricture	25 years	no
39	30	Rectal stricture	3 years	yes
40	40	Rectal stricture	8 years	yes
41	40	Rectal stricture	4 years	yes
42	35	Rectal stricture, vulvar ulcer	6 months	no
43	40	Inguinal periadenitis	1 month	yes

LYMPHOPATHIA VENEREUM IN THE MALE TREATED WITH AUTOSERUM WITH IMPROVEMENT

Case Number	Age	Involvement	Duration	Syphilis
1	19	Inguinal periadenitis	6 months	yes
2	21	Inguinal periadenitis	3 months	no
3	24	Inguinal periadenitis	5 months	yes
4	30	Inguinal periadenitis	3 months	no
5	29	Rectal stricture	2 years	yes
6	34	Rectal stricture	1 year	no
7	29	Penile lesion	1 month	yes

RECTAL STRICTURE IN THE FEMALE TREATED WITH AUTOSERUM WITHOUT IMPROVEMENT

Case Number	Age	Frei	Syphilis	Diagnosis
1	29	Negative	yes	Postoperative scar
2	22	Negative	yes	Postoperative scar
3	29	Negative	no	Anal tuberculosis

Next I undertook the passive transfer of larger quantities of pooled, infected serum into proved non-infected cases. Two men and two women with negative Frei tests and no sign or history of ever having had the disease were the recipients. Seven to ten c. c. of infected serum, after heating and phenolizing to kill living virus, was injected subcutaneously in each individual at four-day intervals.

C. C. OF INFECTED SERUM GIVEN PER DAY

Frei Negative Cases	1st	5th	9th	13th	17th	21st
C.K.	8	10	0	3	*Frei	
V.G.	10	10	8	10	10	*Frei
A.S.	10	8	9	10	10	*Frei
M.S.	10	8	7	10	8	*Frei?

*Positive.

The first patient developed swelling of the hands and face after the second injection, so the third injection was withheld and the fourth limited to 3 c. c. A positive Frei reaction was obtained on the seventeenth day. After five injections, two patients gave positive reactions on the twenty-first day. The four patients had become questionably positive by that time.

The development of positive reactivity was interpreted as evidence that specific antigen exists in the blood of those infected with the virus of lymphopathia venereum.

THERAPY WITH AUTOSERUM

To test the therapeutic value of this source of human antigen, patients suffering from the disease were given subcutaneously gradually increasing doses of their own serum. The initial quantity was 0.5 c. c. This was increased until the clinical response was comparable to that which resulted from 0.1 c. c. of commercial antigen.* The quantity ranged from 5 to 7 c. c., although I learned that several times as much may be given without deleterious effect.

I evolved a routine of treatment which consisted of taking 10 to 15 c. c. of blood from the median basilic vein and removing the serum either by centrifuge or after clotting. The serum was injected under the skin of the abdominal wall. This procedure did not provoke a severe local reaction, and the response was afebrile. Treatments were given at four-day intervals. A course of twelve injections was considered a single series. Two weeks' rest was permitted between series, and treatment was continued as long as improvement was evident.

*Lederle.

Lesions responded after the second or third injection, and their response paralleled that obtained by use of other forms of specific antigen therapy. In cases with stricture, relief from the sense of pressure in the pelvis was one of the first signs of therapeutic benefit. There occurred also noticeable reduction in the quantity of rectal drainage, which became less purulent and more serous. Bowel movements were freer and less painful. The need for laxatives diminished, and it often became possible to dispense with them. The facies of the patients relaxed from that of fixed anxiety, and a sense of well-being was usually voiced by the patient early in the course of treatment. In cases of inguinal involvement, there was visible reduction in severity of the inflammation, first manifest within 48 to 72 hours. Early cases were completely arrested, healing occurring without the formation of abscesses. In patients with ruptured and infected lymph nodes, edema lessened, discharges became serous, and healing became complete within 2 to 3 weeks.

Fifty-three proven or suspected cases of lymphopathia venereum were studied over a period of three years. Seven of these occurred in males with inguinal or anorectal involvement. Forty-six cases were females, five of whom had rectovaginal fistulae complicating their rectal strictures. Fifty per cent of the entire series gave a positive serologic test for syphilis.

Three cases of rectal stricture with negative Frei reactions were given their own serum or pooled serum from infected cases. There was no therapeutic response. Two of these were cases of postoperative scarring, and the third was proven to be anal tuberculosis secondary to pulmonary tuberculosis.

Two cases of lymphopathia venereum treated with their own serum became sensitive to it. One's extremities and face became swollen after injections of autoserum, and the other developed an asthmatic attack. Both responded to epinephrin. When the dose was reduced to 3 c. c. the patients remained free from side reactions. In these anaphylactic cases, therapeutic response was more rapid than in the others, as shown by their more prompt diminution of pelvic pain, rectal discharge and size of perianal skin tags.

Recent infections responded as early as the first or second week of treatment, and often became symptom-free after the second series of 12 injections. In these, digital examination showed softening of the scar, decrease in inflammation, and greater bowel patency.

In patients whose disease was of long standing, improvement was slower. Cases treated over a long period, such as 6 to 9 months, often appeared to become resistant to their own serum, for they showed no further improvement. These, however, when given several weeks' rest or when given pooled serum instead of autoserum, continued to improve.

The average length of treatment was six months. The longest course of treatment was twenty months.

Anorectal strictures found within the first year or two after initial infection could be healed with only vestigial remains of scarring. Older cases were comparatively resistant to treatment and responded slowly. This I believe to be due to replacement of normal tissues by scar and to the presence of secondary infection superimposed upon a region already pathologically burdened.

Two patients came to colostomy, and one died from a primary anemia.

COMMENT

The question is asked, with regard to this treatment of lymphopathia venereum with autoserum, why the reinjection of a patient's serum should have therapeutic effect. It does; and these facts suggest a basis of explanation: specific antigen from human or animal source has proven effective in the treatment of this disease and therefore any other source could likewise be employed. The presence of this antigen in the blood of those suffering from the ailment has been shown to exist by (1) passive transfer of reactivity and (2) clinical improvement in fifty known cases of the infection which were treated by autoserum as if it were antigen. By removing the serum and reinjecting it under the skin of the patient, an alteration of the autoserum is assumed to take place, for serum sickness has occurred. In Frei negative cases, autoserum and pooled serum have not been effective.

CONCLUSIONS

The serum of an individual infected with lymphopathia venereum is a therapeutically useful source of specific human antigen.

A method of using autoserum as the source of specific antigen is described, and its beneficial therapeutic effect in 50 cases is reported.

Positive reactivity to the Frei test is passively transferable by injecting serum from an infected individual into a normal recipient.

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BUNDLE BRANCH BLOCK*

ETIOLOGY AND PROGNOSIS

By NATHAN BLOOM, M.D.

and

LEONARD D. POLICOFF, M.D.

Richmond, Virginia

This study is based on thirty-five cases of bundle branch block obtained from the records of the Medical College of Virginia, Hospital Division, during the past five years. We did not attempt to review the literature, since Yater[1] and Bohning, Katz, *et al.*,[2] have performed this in recent publications. In all the electrocardiograms studied, the three standard limb leads had been employed and, where indicated, in the recent cases a fourth lead was used. In this latter, the left leg lead is connected to a precordial electrode placed over the cardiac apex, while the right arm acts as an indifferent electrode. This corresponds to lead 4R of the American Heart Association.[3]

Left bundle branch block was considered to be present when QRS was prolonged beyond 0.12 second with the major deflection upwards in QRS_1 and downward in QRS_3, and with the T wave opposite the major deflection in each lead. The converse of this was taken to represent right bundle branch block. Electrocardiograms in which the T deflection had the same direction as the major deflection in that lead, were considered "atypical" or discordant bundle branch block. Bohning, Katz, *et al.*,[2] have classified this type as indeterminate Type I and II, and attempted to show the presence of constant electrocardiographic patterns. Data obtainable from the present series were not sufficient either to substantiate or contradict their findings.

DISTRIBUTION BY TYPE

Left Bundle Branch Block	27
Right Bundle Branch Block	2
Atypical Bundle Branch Block	6
	35

DISTRIBUTION BY SEX

There were 23 males to 12 females. This predominance of males to females in cases of bundle branch block, in a ratio of roughly 2 to 1, was consistent with the findings of others.

DISTRIBUTION BY AGE

Age in Decades	Males	Females	Total
0-10	1 (Age 5)	0	1
11-20	1 (Age 17)	0	1
21-30	1 (Age 25)	1 (Age 29)	2
31-40	2	1	3
41-50	7	1	8
51-60	5	4	9
61-70	6	5	11
			35

28 cases (80 per cent) occurred after the age of 40.
20 cases (57 per cent) occurred after the age of 50.

*Received for publication April 20, 1942.

These data are consistent with the conclusion of Yater[1] and Bohning, Katz, *et al.*,[2] and others, that bundle branch block is more common in the fifth and sixth decades of life. In the males the youngest was 5, with diphtheritic myocarditis, and the oldest 65, with arteriosclerotic and hypertensive cardiovascular disease. Eleven males (48 per cent) were over 51, but only 6 (26 per cent), were 61 or over. In the females the youngest was 29, with congenital heart disease, a patent ductus arteriosus, and the oldest 70, with arteriosclerotic heart disease. Nine females (75 per cent) were over 51, and 5 (42 per cent) were 61 or over.

It would appear that bundle branch block as an accompaniment of cardiovascular disease tends to occur somewhat later in the female than in the male.

DISTRIBUTION BY ETIOLOGY

(1) Coronary artery disease (hypertensive and/or arteriosclerotic heart disease), 26 cases.

In this group, 3 were associated with an acute myocardial infarct, which in each case was posterior in type; one of these was a 65-year-old colored female, in whom a thyroidectomy for toxic adenoma was performed the following year; two patients had aneurysmal dilatation of the aorta, with negative Wassermanns.

(2) Diphtheritic myocarditis, 1 case.

(3) Rheumatic heart disease, 3 cases.

One of these patients had clinically active rheumatic fever with a complicating subacute bacterial endocarditis. One patient had a subacute endocarditis which, in the absence of any other demonstrable heart disease, was believed superimposed on a rheumatic endocarditis.

(4) *Anaphylactoid Reaction.*—A patient had an electrocardiogram taken while he was in an acute episode similar to anaphylactic shock, and showed a pattern typical for an acute posterior infarct with left bundle branch block. This was repeated the following day and the electrocardiogram showed only minor changes suggestive of old myocardial damage. It was believed that this transient bundle branch block resulted from a hypersensitivity to coal tar derivatives.

(5) Congenital heart disease (patent ductus arteriosus), 1 case.

(6) Stokes-Adams syndrome (etiology unknown), 1 case.

(7) Heart disease of unknown etiology, 2 cases.

One of these patients had left ventricular hypertrophy and dilatation of the aorta, without hypertension or a positive Wassermann. The other had a phlebitis migrans and the electrocardiogram showed bizarre changes, with an atypical bundle branch block, which could only be interpreted as some sort of inflammatory activity within the heart, possibly "Fiedler's myocarditis."

Yater[1] drew the conclusion that,

> "Bundle branch block is usually due to disease of the coronary arteries, either rheumatic or degenerative, or to hypertension resulting in strain of the left ventricle and impairment of the nutrition of the endocardium and bundle branch."

Our findings substantiate this statement. However, it would appear that other inflammatory or degenerative conditions of the myocardium are capable of producing such changes. Further, a transient bundle branch block appeared during an anaphylactoid reaction, where the mechanism might well have been a spasm of the coronary arteries. Rheumatic heart disease was not, in this series, an important etiologic agent of bundle branch block. Only 3 cases (8.6 per cent) were a result of rheumatic heart disease. King[4] reported on 155 instances of bundle branch block. In his cases syphilitic aortitis was reported as the etiologic factor in 14. Sampson and Nagle[5] report a similar incidence of syphilitic aortitis as the etiologic agent of bundle branch block. It is, therefore, interesting that none of the patients in the present series had clinically demonstrable luetic aortitis or aortic regurgitation, with aortic in-

RELATION OF ETIOLOGY TO TYPE OF BUNDLE BRANCH BLOCK

Atypical bundle branch block—	
Coronary artery disease (arteriosclerotic and hypertensive heart disease)	4
Stokes-Adams syndrome (with cardiac enlargement and complete A-V block)	1
Phlebitis migrans (with cardiac disease of unknown etiology)	1
Right bundle branch block—	
Diphtheritic myocarditis	1
Rheumatic heart disease, active, with complicating subacute bacterial endocarditis	1
Left bundle branch block—	
Congenital heart disease	1
Coronary artery disease (including one case diagnosed as anaphylactic shock and one of unknown etiology)	24
Rheumatic heart disease (one case with a subacute bacterial endocarditis)	2

volvement. This is all the more remarkable in that a large number of the Medical College of Virginia, Hospital Division, patients are colored, in whom there is a fairly high incidence of tertiary cardiovascular syphilis.

From these data it would seem that left bundle branch block is, in the overwhelming majority of cases, a result of coronary artery disease, with or without the presence of hypertension. However, other fibrosing or inflammatory condition of the myocardium, and possibly of the endocardium, in the region of the left bundle, may produce a left bundle branch block. Rheumatic heart disease is usually considered the major cause of right bundle branch block. In this small series, only 3 cases of rheumatic heart disease were present, yet in two a left bundle branch block was produced. Atypical bundle branch block may be due to unusual cardiac conditions, but seems more often to follow coronary artery disease. Yater[1] held that usually when bundle branch block occurred, both bundle branches were injured, but one more than the other. Bohning, *et al.*,[2] says that,

"The first indeterminate type of intraventricular block appears to represent a mixture of delay in the right and left ventricles."

These statements provide a rational explanation for the occurrence of so-called atypical bundle branch block.

PROGNOSIS IN BUNDLE BRANCH BLOCK

The Immediate Prognosis.—Seven patients with bundle branch block died during the hospital admission in which this condition was discovered. Of these, two were right bundle branch block and five were left bundle branch block. No case of atypical bundle branch block resulted in death. The cases of right bundle branch block in which death occurred represented a diphtheritic myocarditis and a subacute bacterial endocarditis.

The cases of left bundle branch block in which death occurred were: coronary artery disease, 3 (a total of 11.5 per cent of all cases of coronary artery disease in this series); subacute bacterial endocarditis, 1; heart disease of unknown etiology, 1 (this patient died at home in unknown circumstances four days after an electrocardiogram in the out-patient department). Three of the latter group developed congestive failure. In one, there was, in addition, pulmonary hemorrhage, and in another, the failure was precipitated by an acute myocardial infarct and terminated in uremia. The ages of those who died during this period were 5, 25, 42, 47, 59 and 63.

There is apparently no true relationship between the type of bundle branch and the immediate prognosis. The etiology of the condition appears to be the key factor in the immediate prognosis.

The Ultimate Prognosis of Bundle Branch Block.—Letters were sent to all the patients in this series who had been discharged from the hospital after bundle branch block developed. In addition, out-patient department charts were investigated for any available information. Partial or complete information as to the further course of 20 patients was available. This does not include the 7 who died in the hospital. It was impossible to locate 8 patients and the only data concerning them were on their hospital charts at the time of discharge. Of these 20 patients, 16 were alive when located. Most of them had a functional capacity of grade 3, and many of them had developed angina pectoris. The longest time since onset of bundle branch block was 39 months and the shortest 1 month. The average time elapsed was 9 months. The remaining 4 patients had died at intervals of 6, 11, 16 and 18 months after the onset of bundle branch block.

RELATION OF ULTIMATE PROGNOSIS TO ETIOLOGY

(These data include the 7 deaths previously described.)

Six patients died. The shortest interval from the onset of bundle branch block to the time of death was 1 day, and the longest was 16 months. All of these patients were between the ages of 49 and 64 years. One of them had a coronary thrombosis, one had auricular fibrillation with a pulmonary infarct, two had recurring attacks of congestive heart failure. These deaths constitute 23 per cent of the cases of bundle branch block resulting from coronary artery disease. Since advanced coronary artery disease in the age group from 50 to 65 of itself confers a prognosis as serious as this, if not more so, we must conclude that bundle branch does not affect adversely the prognosis of otherwise uncomplicated coronary artery disease. This conclusion agrees with that of Flaxman[6] that,

"Bundle branch block, graphically noted in this case of hypertensive heart disease, occurs in 55 per cent of all cases. It has no definite diagnostic or prognostic significance in hypertensive patients. The prognosis is that of the underlying heart condition, particularly in relation to occurrence of congestive heart failure."

Wood, Jeffers, and Wolferth,[7] concluded that

bundle branch block was not an ominous sign unless accompanied by other heart disease.

Rheumatic Heart Disease, 3 Cases.—Two patients died. Both had subacute bacterial endocarditis. One was 25 and the other 42 years of age. The former died the day after admission and the latter within a week after admission. The one patient with uncomplicated rheumatic heart disease was alive 19 months after the electrocardiographic diagnosis of bundle branch block. Again we must conclude that bundle branch block plays no part in the prognosis of the disease.

Diphtheritic Myocarditis, 1 Case.—This patient, aged 5, died one week after admission to the hospital. Since the presence of myocarditis following a fairly long standing nasal and pharyngeal diphtheria frequently results in a fatal termination, we do not believe any valid conclusions as to the prognostic significance of bundle branch block in this case may be drawn.

MISCELLANEOUS ETIOLOGICAL AGENTS, 5 CASES

Congenital Heart Disease (Patent Ductus Arteriosus).—A patient, aged 29, had bundle branch block of one month duration. Auricular fibrillation with recurring attacks of congestive heart failure had been present for seven years. The bundle branch block appeared to be a late development, which apparently had not accelerated the gradually downhill progress.

Anaphylactoid Reaction. — Bundle branch block appeared as a transient phenomenon on the electrocardiogram of a patient following a reaction to aspirin. The next day it had disappeared. The patient made an uneventful recovery. This case will be reported in detail for a later publication.

Diseases of Unknown Etiology.—There were 3 cases of this type. A patient with Stokes-Adams syndrome died at home, 18 months after bundle branch block developed. A patient with hypertrophied left ventricle and dilatation of the aorta without hypertension or a positive Wassermann died at home, four days after bunble branch block was found on the electrocardiogram. A patient with phlebitis migrans was alive a month after the development of the bundle branch block, and apparently is improving rather than regressing.

Since, in these three cases, the etiology of the heart disease was unknown, there could be no valid conclusions as to the prognostic significance of the bundle branch block.

SUMMARY AND CONCLUSIONS

Thirty-five cases of bundle branch block have been reviewed.

(1) Left bundle branch block was the predominant type. Atypical forms of bundle branch block were more common than right bundle branch block, which was relatively rare.

(2) Males, more than females, frequently develop bundle branch block. In this series, males showed a tendency to develop bundle branch block at an earlier age than females. The great majority of cases in both sexes develop in the fifth and sixth decades of life, but no age group was exempt.

(3) The predominating etiologic agent was coronary artery disease. Cardiovascular syphilis did not appear to be a very important etiologic factor. Rheumatic heart disease was far less important than coronary artery disease in the etiology of bundle branch block.

(4) Transient bundle branch block occurs occasionally in an anaphylactoid reaction.

(5) There is no relationship between the type of bundle branch block or the age of onset of bundle branch block and the immediate prognosis. The onset of bundle branch block does not appear to affect either the immediate or ultimate prognosis. The prognosis of bundle branch block seems to be that of the disease which produces it.

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Medical College of Virginia

INTESTINAL RUPTURE FOLLOWING PATIENT'S ATTEMPT TO REDUCE HIS HERNIA*

By FRANCIS J. KIRBY, M.D., F.A.C.S.

and

NATHAN E. NEEDLE, M.D.
Baltimore, Maryland

May 4, 1942, G. P. S., a man of 59, had been operated upon for right inguinal hernia twenty-five years before. Ten years ago the hernia returned, gradually increasing in size. The hernia would come down at times, especially after strenuous exertion and he was always successful at reducing it.

At two-thirty this afternoon his hernia came down and he worked vigorously at it for one and one-half hours before he succeeded in reducing it. Almost immediately after reduction of his rupture he was seized with severe pain in the rectum, with slight nausea and a desire to pass his urine, but he was unable to void.

The pain spread upward over his abdomen with marked sensitiveness which persisted. There was no further nausea or vomiting. The patient was seen at 10:30 p. m. His rectal temperature was 98.6° F., pulse 72 regular, and blood pressure 140/90. He was complaining of generalized pain over the abdomen and opposed examination on account of the severe tenderness to slightest pressure.

The abdomen was flat and soft, and there was no rigidity or muscle spasm. He was very tender to palpation, and this same sensitiveness was elicited over the hernial sac.

A diagnosis of acute peritonitis was made and the patient advised to enter the hospital without delay. He entered St. Joseph's Hospital about midnight; urine examination was negative. Red blood cells were 4,500,000; white blood cells 14,800; polymorphonuclears 86 per cent. Spinal anesthesia was administered.

An incision was made over the hernial sac. Upon opening the sac bile stained fluid, containing yellowish white flaky material, poured out. This fluid had practically no odor and was at once regarded as small intestine contents.

An incision was then made through the right rectus muscle, the abdomen opened and found to contain considerable quantity of this same fluid and pus. The intestines were dull in color, much of them covered over with thick layers of fibrinous exudate.

Upon placing the hand in the pelvis and raising up the small intestines, a ragged tear (rupture) 3.5 cm. long was found in the ileum, from which small intestinal contents were pouring out.

This tear in the ileum was sutured with silk and all fluid material, consisting of pus and intestinal contents, was aspirated. Four grams of sulfanilamide was dusted over the intestines and in the pelvis. The abdominal wound was closed with one small cigarette drain down in the pelvis. The hernial sac which was thickened was freed, twisted and tied off high up, the excess of sac excised; and the wound closed in the usual manner for the repair of a hernia.

The cord was not transplanted, silk being used for sutures. The patient was returned to bed in good condition.

Next day, May 6, 250 c. c. of blood was given as a therapeutic aid. Very little blood was lost at operation. Blood (Kline) test was negative. Because of the tendency of sulfathiazole to become flaky or cake-like in the abdominal cavity, sulfanilamide was used.

The patient made a steady, uninterrupted recovery and left the hospital healed two weeks after operation.

While this case is one that would very rarely occur, the possibility of such an accident must be borne in mind, hence our desire for submitting it for publication.

110 E. North Avenue
2314 W. North Avenue

*Received for publication October 14, 1942.

HEALTH SERVICE AND THE WAR EFFORT*

By I. C. RIGGIN, M.D.†
Richmond, Virginia

It has long been axiomatic that the health, prosperity and progress of our country depend upon a healthy people. Today, because of the worldwide tragedy, the very safety of the nation is directly related to physical well-being.

All of us know victory cannot be achieved by combat strength alone. The battle of production, miraculously efficient as it is, requires the maintenance of the health of the industrial worker and of all others directly or indirectly associated with the war effort. Indeed, the morale of the entire population, the young, the middle-aged, and the old, rests upon maximum well-being to a greater extent than is realized by the average person.

Hence, what was once a major problem to the medical profession and public health officials, now has become an urgent and paramount necessity to every individual. Each one here should appreciate this fact. The existing conditions place upon all of us the obligation not only of maintaining the present general health

*Chairman's Address, Section on Public Health, Southern Medical Association, Thirty-Sixth Annual Meeting, Richmond, Virginia, November 10-12, 1942.

†Virginia State Health Commissioner.

standard, but of improving it if it is possible to do so.

At this point, therefore, it may be wise to consider the present health situation. The marked reduction in some of the most devastating diseases, due largely to discoveries in medical science and to developments and improvements in public health methods and procedures, is familiar to us all.

We have seen a drastic decline in tuberculosis deaths from 1915 to 1940. There have been great reductions in deaths from typhoid, diphtheria, malaria and from all puerperal causes. And yet, as an example of what may happen unless every precaution is taken, there has been an increase in the tuberculosis rate not only in this state, but in many other sections of the country.

The venereal disease problem as brought to light by selective service is far from satisfactory. The application of extensive and intensive control measures is being relied upon to reduce the more immediate dangers to the civilian population and to minimize the extra-cantonment hazards to the military. As you are aware, this program has been developed and expanded to include education both of the physician and the layman, the treatment of cases by private physicians, and the care of indigent cases in clinics; the follow-up of infectious patients and control measures against infectious sources being emphasized.

We all realize that the health of the worker behind the machine is of equal importance to that of the man behind the gun. This fact has given great impetus to the industrial hygiene programs upon which state and local health departments have focused their attention only in very recent years. Initiated with an emphasis upon occupational disease, it soon became evident that, while very important, occupational diseases *per se* were but a part of the necessary interest. Ordinary illnesses of the worker and his family are involved in this program, thereby challenging the efforts not only of the industrial executives, industrial physicians, public health officials, but of the family physician and the medical profession generally. This expanded industrial hygiene program has the enthusiastic support of industry.

Due to increased demand for production of war material in all types of industry, there is danger that control measures may lack proper emphasis. Because of this possible tendency, the break-neck production speed, and the thousands of new and untrained workers, there is greater need than ever for a general and thorough application of health and safety measures. It is a service that the industrial physician, the family doctor, and the public health official must render.

That the general welfare of our people is definitely connected with the health of mothers and children, and that children should have health supervision from the prenatal period through adolescence also are well recognized principles. Again, the war has intensified our consciousness of this necessity.

In no previous time in our history have so many services been developed to aid us in this basic objective. The program providing health service for mothers and children in most states is well developed in the counties having full-time health departments. For example, in Virginia, included in this service are more than 142 maternal and child health clinics, conducted by practicing physicians who serve as clinicians. Each one of these clinics is a practical demonstration to each local community of the advantages of adequate medical supervision for all mothers and children. Group instruction in maternal and infant care should be at all times a part of this service.

There is urgent need at this time for complete medical examination of all boys and girls of high school age at regular intervals, including provisions for the correction of remedial defects. Through the cooperation of health and education authorities there should be developed an extension of health services for school children, including health instruction and medical care as needed.

The needs of our children must be one of our first considerations. Should there be a national or local shortage of food, as is threatened, special attention must be given to providing milk and other protective foods for our children if they are to be strong, healthy, and have normal growth. Information concerning the family food requirements must be available to parents. School meals under proper supervision are effective means of supplementing home nutrition, and at the same time educate the children and their families in good food habits.

Even though methods of detecting physical defects and impairments have progressed, there is still room for improvement in our methods of finding these defects and impairments as well

as in the improvements for institution of corrective measures. The medical and dental professions realize the importance of finding these conditions and the necessity for their correction in the preservation of health. The failure to secure a high percentage of corrections in remedial defects in children probably is due to our failure to impress sufficiently upon parents the need for competent medical and dental care.

The necessity for this correction of physical defects has been shown by the large number of rejections in selective service. If the number of physical impairments reported is correct, then it is evident that in younger and older groups, both male and female, these conditions with respect to health are proportionately greater.

It is known that many of the defects found are directly traceable to infections in childhood: the occurrence of preventable diseases and unhealthful environmental conditions which can be controlled and prevented.

Nutrition as a factor in defense has been the subject of much research. Dietary surveys, selective service examinations, and studies of the nutritional status both of individuals and groups indicate that approximately one-third of the people of the United States are poorly fed, and that they are failing to get proper food elements necessary for strength and health.

It is vital that modern knowledge of nutrition be made available to all of the people. Many of our people do not get the proper protective foods such as milk, green and yellow vegetables, eggs and fruit. Oftentimes this can be attributed to a lack of funds rather than to carelessness and neglect; in other instances to a lack of knowledge concerning nutrition and the value of foods.

By legislation, the responsibility for the prevention of the spread of disease is an obligation placed on the official health agencies. Every available means must be used to discharge this responsibility. It is recognized that the supervision of water supplies, sewage disposal, information pertaining to vital statistics, collection of reports on communicable diseases and the institution of methods against the spread of diseases are functions that can be performed only by such official agencies. The importance of environmental sanitation in the prevention of disease and the promotion of health has long been recognized. It should be emphasized that community measures where applicable for protection of public health are much to be preferred to those measures requiring individual conformity.

In the beginning the establishment of most health activities, such as the control of communicable diseases, protection of public water supplies, and sanitation, were the direct responsibilities of the central state health agency. It has been proven, however, that such methods of control are not always adequate. The development of some type of local health service for a city, county or district has been found to be necessary to accomplish reasonably favorable results.

The control and prevention of disease and the preservation of health are based fundamentally on local health service. These local health services should operate in full cooperation with the State Department of Health as an integral part of the respective local governments, if maximum results are to be obtained.

The war effort has placed on the entire citizenry unexpected responsibilities in relation to health. The expansion of the war effort, including the construction of camps, supply depots, ammunition plants, and the increase in our armed forces, has resulted in an enormous influx of war workers in many localities throughout the southern states. In practically none of the communities which were involved was it possible to house or care adequately for the sudden increase in population. The health problems became acute, especially those involving housing, safe water supplies, adequate sewage disposal facilities, sanitation of food establishments and medical care. It was and continues to be necessary for many workers to live in trailers, grouped in trailer camps. Proper sanitation in this form of habitation has been and still is a problem.

The schools are totally inadequate to care for the unexpected increase in school population. It has been necessary to inaugurate campaigns for the immunization of these children against smallpox, diphtheria and typhoid, as many had received no protection against disease through these immunization procedures. Additional maternal and child health clinics, as well as additional clinics for venereal disease and tuberculosis control, have been established. All the problems engendered by our war effort in relation to health have not as yet been met adequately, nor can they be met fully and solved without the full determination of all the people to see that the health of the citizens is preserved.

The physicians and public health officials must inspire and lead the way.

A definite handicap in the rendering of an efficient health service is the shortage of qualified health personnel. During the past year, many professional and technical workers in state and county health departments have been called into active service or have resigned to accept more lucrative positions. It is not anticipated that the situation with regard to personnel will improve in the immediate future; therefore, with the personnel available and through the utilization and training of others, these problems must be met. This is a real problem.

Adequate health service for the entire population must be the goal. Spreading the complete public health activities thinner, especially in the rural areas, however undesirable it may be, seems to be the only solution to the health officers' inability to obtain additional trained personnel. Full-time health services must be districted so as to provide medical supervision to those local health departments which have been deprived of this service. Home nursing classes, with which all of you are familiar, may tend to lessen the seriousness of this situation by releasing the remaining practicing physicians for the more serious illnesses as compared to the trivialities which have been included in their past services.

With the need for physicians, dentists, and nurses in the armed forces of this country, there is every possibility that the medical services will not be available to the civilian population in the future to the extent that they have been in the past. It is necessary, therefore, that we inspire the public to maintain its individual health at the highest possible level so that the services of these professions with their depleted personnel can function fairly satisfactorily. Every means at our disposal should be made to maintain our community health standards.

The health of the civilian population of this nation is a matter of grave concern. The efficiency of the armed forces and the industrial workers and of the civilian population depends upon good health. Health in the war effort requires action on the part of every individual.

Physicians and health officers cannot be unmindful of this obligation to the soldier and sailor in defense areas. The health hazards from communicable diseases that have their origin in faulty environmental sanitation, in unsafe water and milk supplies and in insanitary food and eating establishments cannot be overlooked. Rigid enforcement of existing milk, food and sanitation ordinances, the promotion of the adoption of ordinances for the protection of the public health in communities which do not have such ordinances and increased sanitation service already have shown definite results in the elimination of potential health hazards in communities proximate to military concentrations.

The health of the civilian population and the health of the armed forces must be maintained and protected, for the physical well-being of the people will determine to a great extent the successful conclusion of this war.

THE TRAINING OF MEDICAL TECHNOLOGISTS AS A FUNCTION OF THE MEDICAL SCHOOL*

By L. W. DIGGS, M.D.
Memphis, Tennessee

Previous to 1900, laboratory procedures played little part in the practice of medicine. Since 1900 there has been rapid and continuous development of new laboratory tests. Physicians wishing to give their patients the benefits of clinical procedures found that they did not have time to conduct tests personally and consequently looked around for assistance. The technical assistants were recruited from any available source and were taught to perform the particular tests required. Preliminary training in basic sciences, college education and training in the general field of medical technology were not considered necessary. As special tests in bacteriology, chemistry, serology and clinical pathology became essential in medical practice and as tissue diagnosis became more important, it became necessary to organize schools for the training of technicians.

The training was done in various types of laboratories, mainly by the apprentice system. Prerequisites for admission, subjects taught and duration of courses varied widely. Some of the training was given by technicians, with and without the supervision of physicians and often without the supervision of qualified pathologists.

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*Read by title, Section on Medical Education and Hospital Training, Southern Medical Association, Thirty-Fifth Annual Meeting, St. Louis, Missouri, November 10-13, 1941.

*From the Division of Medicine, University of Tennessee College of Medicine, Memphis, Tennessee.

Much of the training was given by small hospitals and in laboratories of special hospitals such as tuberculosis sanatoria where the variety of laboratory tests was limited and most of the time taken up in performing a few of the more routine tests. Public health laboratories and private laboratories of clinical pathologists found it necessary to train technicians to fill vacancies in their own staff, but technicians trained in these laboratories as a rule did not have adequate clinical material nor sufficient training in many of the important procedures. Because of the shortage of technicians, commercial schools organized for profit were started. These schools have expanded and now seriously challenge the right of the medical profession to define minimal standards or to qualify technicians. Correspondence courses in medical technology have also developed which represent the height of inadequate training. It is obvious that many of the technicians previously trained and now available have been inadequately trained. The most efficient way to combat inferior and commercial schools is to establish an adequate number of good schools.

In 1923 the University of Minnesota introduced the first college course in medical technology leading to a B.S. degree. Other colleges and universities followed suit. Today there are 27 colleges awarding degrees in medical technology. Other technical schools have instituted specific training programs in addition to practical training. The tendency in the better schools has been to raise the requirements for admission, to get away from the apprentice system as fast as possible and to separate the training into a period of academic instruction followed by a period of practical work or internship. Another trend has been to place the practical training in the larger general hospitals where all types of laboratory work are performed and where there is adequate clinical teaching material. Ultimately schools for the training of medical laboratory technicians will be developed as independent units comparable to schools of nursing. The best schools will be connected with medical schools.

THE REGISTRY AND APPROVED SCHOOLS

In 1922 the American Society of Clinical Pathologists was organized. This society now includes in its active membership the leading clinical pathologists of the country. The society has from its inception been interested in the training of medical technicians and in raising the standards of training. In 1928 the Board of Registry of the American Society of Clinical Pathologists was appointed. It was the duty of this board to study the status of technical training in this country, to recommend minimal requirements and to qualify technicians considered to be adequately trained. The first registry examinations were given in 1933. By 1940 approximately 7,000 technicians had been certified and had successfully passed the written and practical examinations given by the Registry. Today the majority of the better technical positions in approved hospitals throughout the country are held by registered technicians.

In 1936, the Council of Medical Education and Hospitals of the American Medical Association took over the task of inspecting and approving schools for technical training. This year, 1941, there are 152 approved schools in the country. The essentials for an acceptable school for clinical laboratory technicians as defined by the A. M. A. and the A. S. C. P. are given in *Table 1.*

Acceptable School for Clinical Laboratory Technicians
(A. M. A. and A. S. C. P.)

Prerequisites for Admission	
	Two years' work in accredited college or university
	General and quantitative chemistry
	Biology or bacteriology
	Physics and organic chemistry recommended
	Graduates from recognized schools of nursing required to have one year of college with courses in chemistry and biology
Technical Course	
	At least 12 months' training
	Biochemistry, hematology, bacteriology, parasitology, histology, serology, record keeping
	Organized instruction, practical work, oral and written examinations
	Records of credits, credentials, attendance, performance, grades
Schools in or Affiliated with General Hospitals Which Have	
	2,000 or more admissions per year
	Varied clinical material
	Adequate space, equipment, library, records, etc.
	Director who is qualified pathologist
	1 : 1 student-instructor ratio for practical work
Other Essentials	
	At least two students per class
	Continuity of instruction
	Training under medical control
	Technicians to be trained to work under qualified physicians
	Student technicians not to be substituted for paid technicians
	Entire cost of instruction not to be paid by student fees
	Exorbitant fees and commercial advertising not allowed

Table 1

WHY MORE APPROVED SCHOOLS ARE NEEDED

At present there is an acute demand for laboratory workers of all sorts because many are attracted by the higher pay of the military and government services and the laboratories connected with war projects. Also, technical staffs have been increased in many clinics as the result of increased spending power of the public and their demand for laboratory services.

A continued demand for well trained technologists can be anticipated on the basis of the following points: (1) New laboratory procedures will continue to be developed as the result of research. (2) Educated people with rapid means of transportation can be expected in future years to plan and organize their health program so that they can get the maximum of adequate medical care including laboratory examinations. The increasing popularity of hospital insurance, the growth of industrial medicine, old age security, veterans' hospitals and increased emphasis on public health, are indicative of a swing away from individualistic medicine and toward group medicine. In these programs the laboratory services will receive more consideration than they have in the past. (3) The American Medical Association and the American College of Surgeons require approved hospitals to have well trained technical staffs and adequate laboratory facilities. (4) Beginning January 1, 1943, all technicians must enter approved schools if they expect to qualify for the Registry of the A. S. C. P. This will disqualify many technical training schools now supplying registered technicians.

In 1940, 700 technicians completed the course in approved schools, which is approximately one for each seven medical students. The ratio of trained technicians to doctors in practice is much less than 1 to 7 for the majority of technicians, being intelligent and educated women with excellent social contacts, usually marry. This necessitates the training of a much larger group each year than would be necessary if they would stay in the laboratory.

Men are unable to support families on the salaries available in medical technology. Men who are intelligent enough to be good technicians usually manage to continue their training and finally become clinical pathologists.

The shortage of technicians that exists is not due to lack of qualified people who desire training, but to a lack of schools and limited enrollment. At the University of Tennessee, for instance, we train 4 technicians a year. We receive on the average one to three letters of inquiry per day from prospective candidates for the course and have each year 50 or more applications from women who have college degrees and fulfill all requirements for admission. In the entire State of Tennessee there are at present 4 approved schools whose combined maximal enrollment is 14. In all of the Southern states included in the Southern Medical Association there are 32 approved schools with a combined enrollment of 432 technicians per year. It is obvious that something should be done to open up the bottle neck that exists between competent people who desire technical training and physicians and medical projects that need good technical help and cannot get it.

TECHNICAL TRAINING AND THE MEDICAL SCHOOL

Medical schools are peculiarly suited to give superior courses in medical technology because they have the tools for teaching in the form of laboratories, lecture rooms, equipment, libraries, material and clinical facilities. Medical schools also have departments of chemistry, bacteriology and serology, parasitology, pathology and clinical pathology which can, with a minimum of extra effort, expand to direct the training of technicians in the various specialties. Medical faculties are best trained to teach medical subjects. Medical administrators are in contact with the needs of the profession and with the educational program as a whole. The public expects medical schools and medical educators to look after their medical needs. Provision for properly trained medical technicians is a part of an adequate medical care program.

In the organization of a technical training school in a medical school or in enlarging an existing school, extra instructors will be needed and an extra budget required. Unless provision can be made for extra administrative, teaching and maintenance costs, the technical school should not be started. The extra work entailed by such a course must not be saddled onto an already overworked teaching staff nor should the extra cost be borne by budgets which are already inadequate for medical teaching, scholarship and research.

It is considered good policy to arrange specific courses for technicians and not allow medical technologists to attend courses with medical students. There are, however, certain courses in the medical curriculum which are essentially technical courses such as clinical pathology,

parasitology, serology and bacteriology, which deal with subjects that both medical students and technicians need to know. Biochemistry courses as organized in most medical schools are not suited for technicians for the technicians need to know the technic of clinical tests, whereas the medical student is mainly concerned with principles and interpretation. Histological technic, record keeping and the use of instruments of precision such as the basal metabolism machine and electrocardiograph should be taught as separate courses. For laboratory work in any of the courses there should be one instructor for each 20 students or less.

Superior medical technologists who have had wide experience in routine and special tests as performed in a general hospital should make ideal instructors. These technicians should command a salary of $150.00 or more per month. The average salary of technicians in approved hospitals in this country is $122.00 per month.[3]

Students taking technical courses should pay a moderate tuition, but should not be expected to pay for the entire cost of instruction. A tuition fee above $200.00 for a six or nine-month course is looked upon with suspicion, for it is out of line with tuition fees paid by students for training in other comparable fields.

For practical work the technicians can be sent to various approved general hospitals for 12 months or longer to acquire skill in the procedures in which they have had preliminary instruction. The hospital in which the students receive their practical training need not be a hospital directly affiliated with the medical school, but the medical school should hold the reins and guide the type of practical work which its students receive. Students should not pay fees for hospital work other than breakage fees, for by the time they have had two or more years of college, basic science courses and general training in medical technology they earn their hospital tuition. Some hospitals provide maintenance in various forms for trained student technicians.

There should be one or more paid technicians for each student technician doing practical work, for the temptation would be for the superintendent to use student technicians in place of paid technicians and require of them assistance in an endless routine and insufficient rotation and training in special tests. Student technicians should not be made responsible for final reports. All reports should go out under the name of a qualified technician or laboratory director.

The admissions to the school of laboratory technic should be handled through the administrative office rather than through one of the divisions of the medical school, in order that the needs of the entire university and the needs of the profession be served rather than the needs of a single division or individual. The divisions of pathology and clinical laboratories and the other departments concerned with the training of technicians should all have a part in directing policies and in choosing candidates.

CONCLUSIONS

There is a shortage of approved training schools for laboratory technicians and a shortage of properly trained technicians. Medical schools are ideal sites for technical training schools. Medical educators should seriously consider the matter of technical training as a part of their responsibility.

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Southern Medical Journal

JOURNAL OF THE

SOUTHERN MEDICAL ASSOCIATION

Copyright, Southern Medical Association, 1942. Published monthly by the Southern Medical Association, Empire Building, Birmingham, Alabama. Annual subscription, $4.00. Single copies, 35c each.

Entered as second-class matter at the Post Office at Birmingham, Alabama, under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 20, 1921.

M. Y. DABNEY, M.D., Editor
C. P. LORANZ, Secretary, Treasurer and General Manager

Volume 35 DECEMBER 1942 Number 12

EDITORIAL DEPARTMENT

THE RICHMOND MEETING

The dislocations of war have caused many men to change the type of their practice, and sometimes to reenter fields which they have not considered for some years. Specialists who are serving with the armed forces sometimes find themselves doing work the details of which they have forgotten. Many physicians who remain in civil practice have had to enlarge the scope of their work and refresh themselves upon subjects not touched upon for years. Practically all have found their hours of work greatly increased. Many men who attended the November meeting of the Southern Medical Association said they had reached a stage of overwork which required at least a brief respite from the demands of the ailing. To these, the Richmond meeting furnished three days of complete change, with some relaxation through the opportunity to hear and mingle with men in all lines of work; to examine scientific exhibits upon methods of the current year; and among technical exhibits and elsewhere to learn the use of new instruments and medicaments. The necessarily decreased size of the whole group made possible more intimate contacts. The Association has adjusted itself to the necessities of war, and its thirty-sixth annual meeting was a welcome interlude for all who came.

Nearly fourteen hundred physicians registered, many in uniform. The total attendance was something under twenty-five hundred persons, which was ample for a good and instructive meeting, and to produce every type of discussion.

Though Richmond has various war activities, it has not suffered the sudden great increase of population of many of the war boom towns whose crowding would have made impossible the housing of a large meeting like the Southern Medical. Hotel headquarters and nearby buildings provided space for the various groups to convene. The hosts were as charming and hospitable as Virginians are always known to be. The facilities of the distinguished Medical College of Virginia added to the teaching value of the meeting. Local clinics on Richmond day were well attended. More than three hundred women guests were most delightfully entertained, even though on a wartime, gasoline-rationed basis.

OFFICERS

The new President, elected at the St. Louis meeting, is Dr. Harvey F. Garrison, of Jackson, Mississippi. A distinguished pediatrician, a capable and untiring worker, he will preside over the 1943 meeting. The new President-Elect, Dr. W. T. Wootton, well-known internist of Hot Springs National Park, Arkansas, is one of the oldest members of the Association, not in years of his life but in his period of membership. Vice-President is Dr. Wyndham B. Blanton, of Richmond. Chairman of the Board of Trustees is Dr. Frank K. Boland, of Atlanta; Chairman of the Council and of the Executive Committee of the Council is Dr. Lucien A. LeDoux, of New Orleans. The Executive Committee of the Council consists of Dr. Lucien A. LeDoux, of New Orleans, Chairman; Dr. Oscar B. Hunter, of Washington, and Dr. Curtice Rosser, of Dallas.

AWARDS

The Association's award for outstanding original work by one of its members went to Dr. Perrin H. Long, of Johns Hopkins University Medical School, for his studies over many years upon the sulfonamides. Dr. Long, who pioneered in introducing these preparations in the United States and in evaluating their reactions in laboratory animals and human beings, is now serving overseas. The award was received for him by his associate, Dr. Eleanor A. Bliss.

The awards for Scientific Exhibits this year went, first to Dr. John E. Dees, of Duke University School of Medicine, for work upon the use of an intrapelvic coagulum in pyelolithot-

omy; second to Louise Jones and Dr. Randolph H. Hoge, of the Medical College of Virginia, for their exhibit upon the gross anatomy of presacral and facial nerves; and third to Dr. J. Ross Veal and Dr. Roy Klepser, of Georgetown University School of Medicine and Gallinger Municipal Hospital, for their exhibit upon the pathology and treatment of frostbite of the extremities.

This year marks the debut of the two new sections, General Practice and Physical Therapy, which were exceedingly well received and greatly enjoyed both in anticipation and retrospect. The total number of special meetings had been reduced for 1942, because of the smaller number of men who were expected in Richmond.

NEXT MEETING

Because of the rapid changes which must be a part of the Country's program for 1943, it was decided not to select the meeting place for next year until spring. It was agreed that the meeting should be held, but that its location should be determined later as seemed expedient. The Executive Committee of the Council will meet in the spring to choose the city. The time will be as usual, the second or third week in November. It is believed that the Southern Medical meetings are useful and will continue. The Association in its 1942 meeting has continued to prove its value to physicians, the public and the war effort.

SULFONAMIDES IN WINTER

Colds and influenza are the bugbear of the winter months, and each civilian and physician has his own private remedy, which usually he admits works only part of the time. Sulfonamides, being extremely beneficial in many diseases, are apt to be employed for the respiratory diseases in general as they appear. They have some harmful effects, and diagnosis must still be conscientiously considered before they are employed.

Coggeshall and Maier,[1] of the Rockefeller Foundation, list a large series of compounds recently studied as to their activity against experimental influenza and poliomyelitis in white mice, both of which are, of course, viral diseases. The drugs used included several modifications of sulfanilamide, sulfanilylguanidine, sulfadiazine, sulfamethylthiazole and other closely related compounds. Twenty-five sulfonamide preparations in all were very carefully tested. None of them was effective in delaying or preventing the development of either of the viral diseases, or in reducing the mortality. This work should be kept in mind by men who treat virus infections. The sulfonamides do not help them.

Sulfonamides are usually active against streptococci, but there is a tendency to call almost any kind of an angry, slow to heal, and not otherwise diagnosable throat, a streptococcic throat, and to treat it with a sulfonamide, which may merely add a little to the patient's discomfort or lower his blood count. These drugs are also of course sometimes given concomitantly with his period of natural recovery.

The sulfonamides are active against many streptococci and there is no evidence that any of them is beneficial in any disease caused by a filterable virus. They are believed perhaps to interfere with the respiratory mechanism of many bacteria. The minute bodies, the ultramicroscopic causes of infection, or filterable viruses, require an entirely different weapon of chemical destruction, which is still unknown.

1. Coggeshall, L. T.; and Maier, John: J. Pharm. and Exper. Ther., **76**:161 (Oct.) 1942.

COLOR CHANGES

One can never cease to wonder why roses come red and pink out of gray or brown earth, why the black cow eats green grass and gives white milk, why blonds and why gentlemen prefer them, why the colors of the various multicolored animals and fish.

Some of the simple physiologic reasons have been studied in amphibia, and it appears that the endocrine glands have a considerable influence upon color and pigment display.

In the toad, cocaine, ephedrine, nicotine, caffeine and calcium have a paling action upon the skin. They constrict the pigment containing cells. Stoppani,[1] of the Instituto de Fisiologia de la Facultad de Ciencias Medicas de Buenos Aires, has noted that if the adrenals are destroyed, the drugs that ordinarily cause the skin to pale become ineffective. The melanophores (pigment containing cells) of several varieties of toads, he says, are activated exclusively by the adrenals. Other controls may be demonstrated in the production of the pigment within the cells. The adrenals are most important in the

1. Stoppani, Andres O. M.: J. Pharm. and Exper. Ther., **76**: 118 (Oct.) 1942.

regulation of its display. Apparently they do not actually determine the color, but regulate its expansion and intensity or its contraction and paling.

TWENTY-FIVE YEARS AGO
From Journals of 1917

Medical Profession in the War.[1]—The necessity for mobilizing the entire medical profession to conserve the health and lives of our soldiers, as well as of the civil population, was discussed at the recent meeting of the Southern Medical Association by Lieutenant-Colonel Robert E. Noble. . . . According to the present plan some communities are left without physicians; medical colleges which are needed more than ever before, have been deprived of many of their ablest teachers; hospitals have lost almost their entire staffs, and public health activities have suffered. . . .

Pernicious Anemia.[2]—We believe that attention to the diet of the patient is especially important. Gastro-intestinal disturbances are . . . common in the disease . . . most patients who come to us have reduced their food intake . . . far below their needs . . . it is our custom to begin with the milk diet of Dubois . . . by the sixth day the patient is receiving some three quarts. . . . On the seventh day we permit a small piece of bread and a little jam at breakfast time, and at midday we send in a full tray of easily digestible foods. . . . The patient is encouraged to eat regardless of choice or inclination.

Physician Clemenceau.[3]—The man of the hour in France is Georges Clemenceau, noted as an editor, as Prime Minister of France, as a "wrecker of cabinets," and characteristically as "the stormy petrel of French politics." . . . this conspicuous figure in the political life of France is a physician, the son of a physician, and . . . for a time he practiced medicine in Stamford, Connecticut.

1. Editorial. Mobilizing the Medical Profession. South. Med. Jour., **10**:959 (Dec.) 1942.

2. Barker, Llewellys F.; and Sprunt, Thomas P.: Treatment of Some Cases of So-called "Pernicious" Anemia. J.A.M.A., **69**:1919 (Dec.) 1917.

3. Editorial. Clemenceau, a Physician. J.A.M.A., **69**:1976 (Dec.) 1917.

Book Reviews

The Mind and Its Disorders. By James N. Brawner, M.D., Medical Superintendent, Brawner's Sanitarium, Smyrna, Ga. 228 pages. Atlanta, Ga.: Walter W. Brown Publishing Company, 1942. Cloth $3.50.

Dr. Brawner has discarded the bewildering nomenclature which ultra erudite neuro-psychiatrists use, perhaps as a defense mechanism in an effort to conceal their own confused states. This book, therefore, is commended to those specialists in nervous and mental diseases who desire to practice the art of medicine as included in the term psychotherapy in dealing with neurotics and psychotics.

The book is simple yet comprehensive, and may be read with interest and profit from the preface to the last word.

Prevention, as well as the practical management, of mental and nervous disease, is stressed. The application of the mental hygiene advocated would keep many a physician and many more of his patients from becoming inmates in institutions devoted to the care of the mentally ill.

The Interaction of Drugs and Cell Catalysts. By Frederick Bernheim, Ph.D., Associate Professor of Physiology and Pharmacology, Duke University, School of Medicine, Durham, North Carolina. 85 pages. Minneapolis, Minnesota: Burgess Publishing Company, 1942. $2.25.

The purpose of this monograph is to explain the mechanism of drug action on the basis of interference with vital processes involving cell catalysts rather than the present interest in determining the concentration and distribution of drugs in various types of cells. The material is divided into two sections. The first deals with drugs that act on certain enzymes, such as eserine, cyanide, and sulfanilamide, and the second with drugs which are acted on by certain enzymes such as epinephrine, acetanilide and histamine. The author presents his thesis convincingly and backs up his conclusions with a wealth of references.

The book should be of great value to those who wish orientation in this relatively new field and cannot take the time to collect the scattered material. The book is a high grade of mimeographing but is lightly bound and might not stand a great deal of use.

Laboratory Diagnosis of Protozoan Diseases. By Charles Franklin Craig, M.D., (Hon.), F.A.C.S., F.A.C.P., Colonel United States Army Medical Corps. Retired. D.S.M. Emeritus Professor of Tropical Medicine, Medical School, Tulane University. 349 pages, illustrated. Philadelphia: Lea & Febiger, 1942. Cloth $4.50.

This book embraces the lifetime experience of one of the world's leading authorities in the field. It is rich with small points of technic and criteria which only a person long familiar with the subject could write. Dr. Craig is to be congratulated on this work, which will undoubtedly be the standard reference book on protozoan diseases in the clinical laboratory for many years to come.

Lipidosis: Diseases of the Cellular Lipid Metabolism. By Siegfried J. Thannhauser, M.D., Ph.D., Associate Professor of Medicine, Tufts College Medical School, Boston, Massachusetts. 370 pages, illustrated. New York: Oxford University Press. Cloth $6.00.

In the past one of the most confusing subjects in medicine has been that dealing with the disturbances of lipoid metabolism. This confusion has been clarified remarkably by the publication of Dr. Thannhauser's volume. He deals in detail with the various conditions in which cholesterol metabolism is disturbed, and more particularly, with the primary xanthomatoses. He points out the importance of the deposits in the internal organs and emphasizes that xanthomatosis is by no means a disease limited to the skin. There is an excellent dis-

cussion of this disorder as it affects the heart, the liver and other internal organs. The discussion of Schuller-Christian's disease is probably the best to be found in medical literature.

The section of the book dealing with disorders of metabolism of other lipoidal substances is equally complete and valuable, but somewhat less important because the disorders of sphingomyelin and cerebroside metabolism are less common than those of cholesterol metabolism. However, one cannot find anywhere better considerations of Gaucher's disease and of Nieman-Pick's disease. Dr. Thannhauser is probably the world's greatest authority on this subject and has carried out clinical observations which have been accurately and carefully correlated with chemical studies on patients suffering from this group of diseases. The book can be heartily recommended to anyone who is interested in obtaining a clear, complete and up-to-date comprehension of this group of disorders.

Tuberculosis Hospital and Sanatorium Directory. A Directory of Sanatoria, Preventoria, and General Hospitals Having Departments for Tuberculosis Patients. 185 pages. Compiled by the National Tuberculosis Association, New York. June 1942.

This edition of the Directory has long been awaited and needed. The last edition appeared in 1938, and since then many changes have occurred in the tuberculosis hospital picture of the United States.

This latest edition is by far the best and most informative yet issued. More detailed information upon sanatoria is given than heretofore, especially as regards personnel and types of treatment available. It should be in every medical library.

Vascular Sclerosis: With Special Reference to Arteriosclerosis. By Eli Moschcowitz, A.B., M.D., Assistant Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York. 178 pages, illustrated. New York: Oxford University Press, 1942.

The author emphasizes the complete independence of sclerosis in the pulmonary from that in the systemic vessels. He also stresses the importance of local increase in pressure in the production of the vascular changes. Much of the material dealing with systemic sclerosis can be found in other volumes, but the discussion of pulmonary arteriosclerosis is probably better than that available anywhere in the English language. There are numerous excellent photographs.

Lane Medical Lectures: The Lymphatic System. Its Part in Regulating Composition and Volume of Tissue Fluid. By Cecil K. Drinker, Professor of Physiology and Dean of the School of Public Health, Harvard University. Stanford University, California: Stanford University Press, 1942. 235 pages, illustrated. Cloth $2.25. Paper $1.50.

Professor Drinker emphasizes the neglect of the lymphatic circulation, compared to the blood circulation. His book consists almost entirely of the presentation of original research, but there is also a fairly complete review of the work of others. Most of the material cannot be found anywhere else except in the publications of the author and his colleagues. The work has very little direct practical significance and hence the majority of practicing physicians will not care for it. On the other hand, it has great theoretical significance and almost each page carries an implication of some clinical application of the research of the author and his co-workers. Anyone interested in the physiology of digestion, absorption, circulation, injury to tissues, spread of infection, spread of neoplasms, will find much in this little book to give him thought. It seems certain that during the next two decades many investigators will be stimulated to study the lymphatics further and to begin to apply to clinical medicine the principles which have been beautifully worked out by Professor Drinker and his co-workers.

The Modern Attack on Tuberculosis. By Henry D. Chadwick, M.D., Medical Director of Middlesex Tuberculosis Sanatorium, 1938-1941, and Alton S. Pope, M.D., Deputy Commissioner of Public Health and Director of the Division of Tuberculosis, Commonwealth of Massachusetts. 95 pages. New York: The Commonwealth Fund, 1942. Cloth $1.00.

This book lives up to its title and gives a practical and economical plan for the finding and eradication of tuberculosis in a community. County health officers and tuberculosis workers will find here a modern authoritative help for one of their chief problems.

Clinical Cardiology: With Special Reference to Bedside Diagnosis. By William Dressler, M.D., Attending Cardiologist, Israel Zion Hospital; Assistant Attending Physician, Brooklyn Hospital, New York. 692 pages, illustrated. New York: Paul B. Hoeber, Inc., 1942. Cloth $7.50.

The author's aim is to teach the more important aspects of heart disease as they may be approached from a purely clinical point of view, as distinguished from the various laboratory procedures such as electrocardiography and fluoroscopy. This is an admirable approach and, in general, has been adhered to throughout the book. He devotes entirely too little space to a discussion of the importance of the history. Most cardiologists would agree that the patient's story is the most important information the clinician can obtain. The author, however, devotes only five pages to the discussion of the present complaints, compared to thirty-five pages to the discussion of methods of physical examination. This misdirection in emphasis is not a reflection on Dr. Dressler's book only, as the same fault is to be found in practically every book written on the heart.

The first portion deals with methods of examination; the second with general pathology, in which physiology of circulatory failure is discussed; and the third, with special conditions such as the several types of heart disease.

The discussion of the physiology of heart failure is excellent and one wishes that the author had devoted more space to this phase of the subject. The mechanism of production of the various symptoms of cardiac disease is likewise well presented.

The section on treatment is well done in most respects, although there is some question as to the accuracy of the statement that the diastolic relaxation of the cardiac chambers is more complete under the influence of digi-

talis. This statement applies only when the drug causes marked slowing of the rate. The author recognizes that the most important effect of this drug beside slowing of the rate is in increasing the mechanical efficiency of cardiac contractions. The author advocates the use of carbon dioxide baths in patients without congestive failure, but properly expresses some skepticism as to whether it is the bath or the vacation which causes improvement. Many cardiologists will not agree with Dr. Dressler's opinion that strophanthin is a more satisfactory drug than digitalis in patients with left ventricular failure.

The author stresses the advantages of the mercurial diuretics and gives only a short consideration to the xanthines, which though less dramatic, are often, in the long run, more beneficial because they are safer.

These, however, are minor points. The section on treatment is comprehensive, well written and includes most of the best modern thought on the subject of heart disease. In fact, the whole book can be described as one of the better books dealing with this important subject.

The Electrocardiogram and X-Ray Configuration of the Heart. By Arthur M. Master, B.S., M.D., F.A.C.P., Assistant Professor of Clinical Medicine, Columbia University, New York. Second Edition. 404 pages, illustrated. Philadelphia: Lea and Febiger, 1942.

As the author points out, electrocardiographic changes due to arrhythmia and due to damage to the myocardium have been the subjects of very extensive study, while alterations related to changes in the position and configuration of the cardiac chambers have been relatively neglected. It is because of his particular interest in this latter subject that he has correlated in a large series of patients the electrocardiographic changes with the roentgenographic changes, and it is in this correlation that the book is of particular value. The material dealing with electrocardiography is not particularly new and most of it can be found in other standard works on this subject. The same is true in regard to the material dealing with visualization of the heart by x-ray. However, in no other book have the results obtained by the two methods been correlated in a given patient so thoroughly and completely as in this book.

The method of presentation consists largely of specific case reports with an attempt to study the electrocardiograms and the roentgenograms in relation to the clinical features. The author has been quite successful in the integration of these three general features. Any physician who has occasion to make x-ray and electrocardiographic examinations of the heart will find the book useful.

War Medicine. A Symposium. Editor Winfield Scott Pugh, M.D., Commander, (M.C.) U.S.N. Retired, Formerly Surgeon, City Hospital, New York. 565 pages, illustrated. New York: Philosophical Library, 1942. Cloth $7.50.

Of this compilation of fifty-seven papers which have previously been published in various medical journals in this country, Canada, and Great Britain, thirty-three are on surgical subjects, ten are on aviation and naval medicine, and fourteen are on general medical and psychiatric subjects as they apply to the armed forces.

The surgical subjects include various types of war wounds, including burns and anaerobic infections; injuries of the head, including the brain, face, eyes, ears and jaws; wounds of the chest and heart, including abdominal and abdominothoracic injuries; fractures, and miscellaneous subjects, including shock, anesthesia, and blood substitutes.

In the section on aviation and naval medicine, the similarity in effect on the human organism of high altitude flying and deep sea diving is clearly explained.

The section on general medicine includes papers on nutrition, allergy, and psychiatry; on chigger and jigger bites, and on the prophylaxis and treatment of epidermophytosis of the feet.

The authors are outstanding physicians and surgeons of this country and Great Britain, many of whom are on active military or naval service at the present time.

The volume should prove of great interest to medical officers on active duty, in the field or hospital, as well as to physicians and surgeons in civil practice who may be called on at any time in an emergency for the same work.

Advances in Internal Medicine. Editor, J. Murray Steele, M.D., Welfare Hospital, New York, University Division, Welfare Island, N. Y. Volume L. 292 pages, illustrated. New York: Interscience Publishers, Inc., 1942. Cloth $4.50.

Medical progress in a multitude of fields has brought in its wake a correspondingly voluminous literature and many publications which present annual reviews and articles of summarizing nature. For the busy practitioner and hard-pressed specialist there is need for concise, comprehensive surveys which lie between the scholarly, exhaustive presentations of "Medicine" and the fundamental, broad papers which appear in "Physiological Reviews" or the "Annual Review of Biochemistry". In recognition and fulfillment of this need in the field of internal medicine, several adequate publications already exist, but the scope of internal medicine is so broad, progress so rapid, and opinions are so varied, that the introduction of a new volume of similar character and objectives is probably warranted.

"Advances in Internal Medicine" satisfactorily, if not brilliantly, accomplishes its objective.

Under the leadership of Dr. J. Murray Steele, the Editorial Board has selected articles covering use of the Miller-Abbott tube in gastroenterology, insulin therapy in diabetes, sulfonamide drugs, sympathetic nervous control of the peripheral vascular system, urinary tract infections, hypertension, studies upon influenza, nephrosis, and riboflavin deficiency. The fact that certain of the articles duplicate material elsewhere surveyed constitutes an advantage rather than a drawback, since contradictory opinions are often expressed with the consequent broadening of the mental horizons of the reader.

In summary, this initial volume will add nothing to the specialist's knowledge of his own field nor will it lay any new foundation stones in medicine, but it will definitely be of service to the conscientious, average physician who desires to keep abreast of the times.

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Southern Medical News

ALABAMA

The $4,000,000 U. S. Army Hospital proposed for location in Alabama, preferably in a non-defense area, is to be located at Tuscaloosa. A site for the hospital, an area of approximately 200 acres, is being decided upon. 150 acres of the site to be occupied by buildings and the remainder for recreational purposes. The employed personnel will consist of about 1,500 persons, including officers, doctors and attendants.

Dr. Harry Martz, Birmingham, has been called to active duty with the Medical Corps, U. S. Army Air Corps, in the rank of Captain.

Deaths

Dr. James A. Branyon, Fayette, aged 73, died recently of carcinoma of the stomach.

Dr. Samuel Early Centerfit, Montgomery, aged 68, died recently of prostatic hypertrophy and pyonephrosis.

Dr. George A. Dennis, Montgomery, aged 69, died recently.

Dr. William Lee Tucker, Cullman, aged 40, was run over by a train and killed recently at DeQuincy, Louisiana.

ARKANSAS

First Councilor District Medical Society has elected Dr. W. C. Overstreet, Jonesboro, President; and Dr. Earle D. McKelvey, Paragould, Vice-President.

Second Councilor District Medical Society has elected Dr. C. G. Hinkle, Batesville, President; Dr. V. V. McAdams, Cord, Vice-President; and Dr. O. J. T. Johnston, Batesville, Secretary.

Tenth Councilor District Medical Society has elected Dr. C. S. Wilson, Siloam Springs, President; Dr. A. B. Dickey, State Sanatorium, Vice-President; and Dr. Chas. T. Chamberlain, Fort Smith, Secretary.

Dr. Harry E. Murry, Texarkana, recently took special work in traumatic surgery and fractures at Cook County Hospital, Chicago, Illinois.

Dr. Joe F. Rushton, Magnolia, has been elected a Director of the Citizens Bank.

Dr. Ruth Brittain Pickett, formerly of Carrizo Springs, Texas, has located in Conway.

Dr. Luther Davis, formerly of Chatfield, has been appointed Health Director at Walnut Ridge.

Dr. M. V. Russell, El Dorado, has been elected a Fellow of the American Academy of Ophthalmology and Otolaryngology.

Dr. R. B. Robins, Camdem, Dr. W. B. Grayson, Little Rock, and Dr. J. D. Riley, State Sanatorium, have been appointed Vice-Presidents for the annual seal sale of the Arkansas Tuberculosis Association.

Dr. John R. Kitley has been reelected Mayor of Mayflower for the seventeenth term.

Dr. J. C. Faris, Jonesboro, and Miss Hildegarde Bliss, St. Louis, Missouri, were married October 1.

Dr. J. B. Wharton, Jr., Lieutenant, Naval Station, Corpus Christi, Texas, formerly of El Dorado, and Mrs. Iola Holt Pendleton, Shreveport, Louisiana, were married recently.

Dr. J. M. Walls, Blytheville, Captain, Medical Corps, U. S. Army, has been assigned to Headquarters, 12th Hospital Center, Camp Gruber, Oklahoma.

Dr. J. F. Lewis, Fayetteville, Lieutenant (j.g.), Medical Corps, USNR, has been assigned to Naval Hospital, Corpus Christi, Texas.

Dr. J. W. Lamb, Paragould, Lieutenant, Medical Corps, U. S. Army, has been assigned to the Air Base, Salt Lake City, Utah.

Dr. J. W. Branch, Camp Chaffee, has been promoted to Major.

Dr. J. W. Amis, Fort Smith, Lieutenant Commander, Medical Corps, U. S. Navy, is now stationed in the Pacific.

Dr. Jerome S. Levy, formerly of Little Rock, has been transferred from Wm. Beaumont General Hospital, El Paso, Texas, to Bushnell General Hospital, Brigham City, Utah, where he is Chief of Gastroenterological Section.

Dr. C. A. Archer, Jr., Prescott, has moved to Dumas, Texas, where he is associated with the Cactus Ordnance Works.

Dr. A. DeGroat, formerly of Little Rock, Major, Medical Corps, U. S. Army, is now located at the Station Hospital, Fort Custer, Michigan.

Dr. Ellery C. Gay, formerly of Little Rock, Captain, Medical Corps, U. S. Army, is now stationed with 2nd Surgical Hospital Group (Aux.), Lawson General Hospital, Atlanta, Georgia.

Dr. J. M. Kolb, Clarksville, Captain, Medical Corps, U. S. Army, has been assigned to Fort Sam Houston, Texas.

Dr. F. A. Wyatt, Batesville, Captain, Medical Corps, U. S. Army, has been assigned to March Field, Riverside, California.

Dr. M. W. Chastain, Bentonville, Lieutenant, Medical Corps, U. S. Army, has been assigned to Aviation Cadet Training Center, San Antonio, Texas.

Dr. L. L. Hassell, Blytheville, Lieutenant, Medical Reserve Corps, U. S. Army, has been assigned to Fort Sam Houston, Texas.

Dr. Brooks R. Teeter, Russellville, Lieutenant, Medical Corps, U. S. Army, has been assigned to Camp Claiborne, Louisiana.

Dr. G. D. Murphy, Jr., El Dorado, Lieutenant, Medical Corps, U. S. Army, has been assigned to Jefferson Barracks, Missouri.

Dr. Carroll F. Shukers, formerly of Little Rock, has been transferred from LaGarde General Hospital, New Orleans, Louisiana, for duty with the 1st Medical Laboratory at Camp Rucker, Alabama.

Dr. T. Duel Brown, Little Rock, Major, Medical Corps, U. S. Army, has been assigned to Air Force Technical School, Lincoln, Nebraska.

Dr. Hollis H. Buckalew, Little Rock, Captain, Medical Corps, U. S. Army, has been assigned to the Army and Navy General Hospital, Hot Springs National Park.

Dr. Friedman Sisco, Camp Bowie, has been promoted to the rank of Major.

Dr. H. K. Carrington, Magnolia, Captain, Medical Corps, U. S. Army, has been assigned to Hunter Field, Savannah, Georgia.

Dr. John William Smith, Little Rock, Lieutenant, Medical Corps, U. S. Army, has been assigned to New Castle County Airport, Wilmington, Delaware.

Deaths

Dr. Estes Allen, Little Rock, aged 53, died October 17.

Dr. Robert Joseph Haley, Sr., Paragould, aged 74, died recently of coronary thrombosis.

Dr. Harry Thomas Harr, Fayetteville, aged 73, died recently.

Dr. Otto Ralph Honomichl, Hackett, aged 56, died October 3.

Dr. James Monroe Matthews, Morrilton, aged 66, died recently.

DISTRICT OF COLUMBIA

George Washington University, Washington, has added the following new members to the Faculty of the School of Medicine, most of them replacing instructors who have joined the armed forces: Dr. J. Gordon Bell and Dr. Catherine Birch, Instructors in Otorhinolaryngology; Dr. Ruth B. Benedict, Instructor in Medicine; Dr. Sterling Bockoven, Instructor in Ophthalmology; Dr. James T. Burns, Instructor in Medicine; Dr. Frank D. Costenbader, Instructor in Ophthalmology; Dr. Julius R. Epstein, Instructor in Obstetrics and Gynecology; Dr. Dorothy S. Jaeger, Instructor in Pediatrics; Dr. Daniel Jaffee, Instructor in Neurology; Dr. Russell Jon Jansen, Associate in Obstetrics and Gynecology; Dr. Max E. Johnson, Instructor in Neurology; Dr. Morton S. Kaufman, Instructor in Obstetrics; Dr. Irvin Karlin, Instructor in Medicine; Dr. Alan F. Kreglow, Instructor in Medicine; Dr. F. X. McGovern, Associate Clinical Professor of Surgery; Dr. C. Robert Naples, Clinical Instructor in Ophthalmology; Dr. Adolph Rostenberg, Instructor in Dermatology; Dr. Jacob J. Weinstein, Instructor in Surgery, and Dr. Richard W. Wilkinson, Instructor in Ophthalmology.

Georgetown University School of Medicine, Washington, has added the following staff members to its Faculty for the coming year: Dr. Isadore Lattman, Associate Professor of Radiology; Dr. R. Pucher, Assistant Professor in Pathology; Dr. Alfred Baur, Instructor in Clinical Psychiatry; Dr. William J. Evans, Instructor in Clinical Obstetrics; Dr. Clara Hoye, Instructor in Clinical Psychiatry; Dr. Sol Katz, Instructor in Clinical Medicine; Dr. Lawrence B. McCaleb, Instructor in Dermatology; Dr. Howard E. Newman, Instructor in Clinical Surgery; Dr. Charles Morgan, Instructor in Pharmacology; Dr. David Nolan, Instructor in Clinical Obstetrics; Dr. Bernardo E. Nunez, Instructor in Medicine; Dr. Weldon A. Price, Instructor in Clinical Pediatrics; Dr. William N. Ransome, Instructor in Pathology; Dr. S. Riera-Lopea, Fellow in Medicine; Dr. Raymond Schwartz,

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Continued from page 1126

Instructor in Clinical Medicine; Dr. George T. Sharp, Instructor in Clinical Obstetrics; Dr. Ruth E. Standard, Fellow in Medicine; Dr. Bachman S. Smith, Fellow in Pediatrics; and Dr. Morris Wulfson, Instructor in Pediatrics.

Dr. George Baehr, Chief Medical Officer, Office of Civilian Defense, Washington, went to England recently to study Britain's emergency medical service and to confer with medical leaders.

Dr. Sam F. Seeley, Washington, Lieutenant Colonel, Medical Corps, U. S. Army, has been recalled by the Office of the Surgeon General from the Procurement and Assignment Service as Executive Director to become the Commanding Officer of the new Army Hospital at White Sulphur Springs, West Virginia.

Dr. Ward L. Mould, Medical Division, Office of Civilian Defense, Washington, has been appointed Medical Advisor to industrial plants in cooperation with the Emergency Medical Service organized in communities, to assist plant authorities in planning for adequate medical services in the event of a major emergency.

Deaths

Dr. James Augustine Cahill, Jr., Washington, aged 49, died October 19.

Dr. Steuart B. Muncaster, Washington, aged 85, died recently.

FLORIDA

Florida Medical Association's annual meeting, which was to have been held at St. Petersburg in April, 1943, will meet at some other place since the Pinellas County Medical Society advises that developments of the war make it impossible to carry on with the plans for entertaining the State Association.

Dr. W. M. Rowlett, Tampa, spent a month in New Hampshire recently visiting clinics.

Nassau County Medical Society was recently organized and elected Dr. George A. Dame, Inverness, President; Dr. David G. Humphreys, Fernandina, Vice-President; and Dr. Ellsworth F. Waite, Secretary-Treasurer.

Dr. C. J. Heinberg, Pensacola, was recently appointed as Civil Aeronautics Administrator Medical Examiner to examine applicants for enlistment in the air corps.

Dr. Sanford C. Collew, Mount Dora, has been named permanent Chairman of the Florida Crippled Children's Commission.

Dr. J. C. Dickinson, Tampa, was elected to the Executive Council of the American Roentgen Ray Society for a period of three years at its recent annual meeting held in Chicago.

Dr. Wilburn C. Young, Canal Point, and Miss Cora Mitchell, Pahokee, were married recently.

Dr. Louis George Lytton, Miami Beach, and Miss Florence Bender, Brooklyn, were married recently.

Dr. Eugene D. Simmons and Miss Bobbie Dowling Conoly, both of Jacksonville, were married recently.

Deaths

Dr. William Joseph Blackshear, Panama City, aged 77, died recently of chronic myocarditis.

Dr. Thomas Edward Blackshear, Pensacola, aged 71, died recently of coronary occlusion.

Dr. Edward J. Farnum, Fort Meyers, aged 81, died recently of coronary thrombosis.

Dr. Cloyd L. Souder, Safety Harbor, aged 89, died recently of coronary occlusion and arteriosclerosis.

GEORGIA

Southern Psychiatric Association's annual session which was to have been held in Richmond, Virginia, November 6-7, was postponed for the duration of the national emergency. The roster of officers and members will be frozen and all dues suspended until the emergency has passed. The Secretary-Treasurer, Dr. Newdigate M. Owensby, Atlanta, requests that he be kept informed of any change in address of members and be advised of all matters pertaining to the welfare of the Association.

Georgia Pediatric Society will hold its annual scientific meeting in Atlanta, December 10, the afternoon session at the

Continued on page 36

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For use in cases of inoperable uterine prolapse, this new pessary is offered as an improvement upon the well-known Gellhorn Pessary, long used with great success. The Emmert-Gellhorn Pessary is made of one solid piece of Neicomold, a synthetic material that may be boiled. The material is unbreakable and stays smooth in use since it is unaffected by the genital secretions. Neither does it affect or irritate the vaginal mucosa. The shape is approximately that of a mushroom, with the upper surface slightly depressed.

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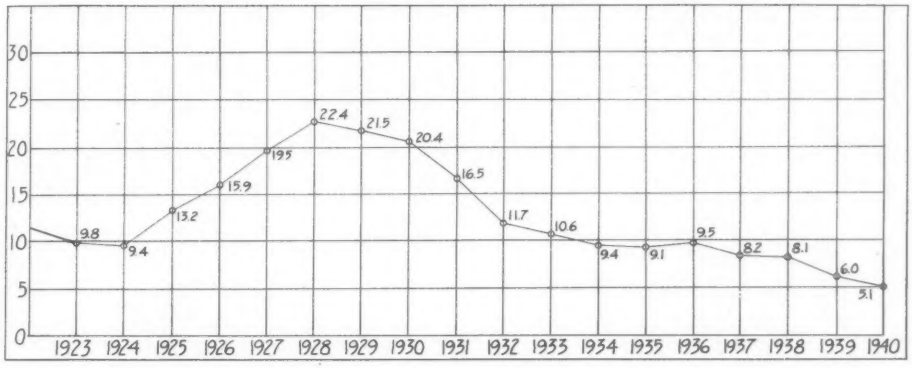
In the article, "Control of Pellagra," in the November 1942 Southern Medical Journal, the writer, Dr. Wm. DeKleine, a leader in the conquering of pellagra, gives a mortality and decrease in death rate chart, arranged by the U. S. Public Health Service, as follows:

DEATH RATES FROM PELLAGRA PER 100,000 POPULATION IN THIRTEEN SOUTHERN STATES



Giving nicotinic acid, an important part of, but not the whole of the anti-pellagric factor, all credit for what it has done, the article says:

> "It is evident that various factors have contributed to the marked and continued reduction in pellagra mortality since 1928. None of them has played a more important role than brewers' yeast."

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Continued from page 34

Biltmore Hotel and the evening session at the Academy of Medicine, Fulton County Medical Society.

Southern Surgical Association meeting, which was to have been held in Savannah, December 8-10, has been canceled.

Dr. Glenville Giddings, Atlanta, has been appointed on the Agricultural and Industrial Relations Committee of the Southern Regional Research Laboratory of the American Medical Association.

Dr. Thomas F. Abercrombie, Atlanta, has completed twenty-five years as Director of the Georgia Department of Public Health.

Dr. Leon E. Brawner, Atlanta, announces the removal of his offices to Suite 803 Medical Arts Building.

Dr. Theodore Toepel, Atlanta, announces the opening of his office in Suite 407 Grand Theatre Building.

Dr. L. Harvey Hamff, Atlanta, announces the opening of offices at Suite 322 Doctors Building.

Dr. Emmett Smyer Brannon and Miss Anna Margaret Bond, both of Atlanta, were married recently.

Dr. Hubert R. Owen, Atlanta, and Miss Esther Jane Corley, Boaz, Alabama, were married recently.

The following physicians have been enlisted in the U. S. Army, Navy or war activities: Dr. Braswell E. Collins, Waycross; Dr. L. M. Freedman, Savannah; Dr. W. R. McGinty, Moultrie; Dr. James C. Metts, Savannah; Dr. Lovick Pierce, Waycross; Dr. J. M. Tribble, Senoia; and Dr. Charles N. Wasden, Macon.

Deaths

Dr. Robert Lee Cater, Perry, aged 76, died recently.

Dr. John Thomas Floyd, Atlanta, aged 61, died recently of coronary thrombosis.

Dr. Arthur R. Heyward, Warwick, aged 71, died recently of typhus fever.

KENTUCKY

Kentucky State Medical Association at its recent annual meeting installed Dr. E. Murphy Howard, Harlan, President; and elected Dr. Caswell C. Turner, Glasgow, President-Elect; Dr. Oscar O. Miller, Louisville, Dr. Charles L. Sherman, Millwood, and Dr. D. Hunter Coleman, Harrodsburg, Vice-Presidents. Dr. Ben Wilson Smock, Louisville, was chosen to give the oration in surgery in 1943 and Dr. Charles B. Stacy, Pineville, the oration in medicine.

Dr. Harry Goldberg, Louisville, Lieutenant Colonel, has been named the Senior Medical Officer at the U. S. Navy School for Signalmen and Radiomen, located at the University of Chicago.

Dr. F. Hays Threlkel, Beaver Dam, First Lieutenant, Medical Corps, U. S. Army, has been ordered to report at the Fifth Evacuation Hospital, Camp Rucker, Alabama.

Dr. Martin H. Skaggs, Taylorsville, has been elected Health Officer of Shelby County.

Dr. Everett H. Baker, Louisville, and Miss Mildred Smith, New Albany, Indiana, were married recently.

Dr. John D. Lecky, Calvert City, and Miss Sara Watts Nichols, Glasgow, were married recently.

Dr. Thomas Milton Marshall, Frankfort, and Miss Nancye Miller, Hardinsburg, were married recently.

Deaths

Dr. Sterling S. Brown, Pleasant View, aged 71, died recently of heart block.

Dr. James Dudley George, Corinth, aged 73, died recently of myocarditis.

Dr. Lattie Graves, Scottsville, aged 61, died recently of coronary thrombosis.

Dr. Clarence Trimble Ricketts, Manchester, aged 67, died recently of coronary thrombosis and pulmonary embolism.

Dr. Killiam Homer Strahan, Covington, aged 56, died recently of coronary thrombosis.

Dr. John Q. Taylor, Paducah, aged 89, died recently of arteriosclerosis.

Dr. Harry Tyldesley, Central City, aged 68, died recently of cerebral hemorrhage and arteriosclerosis.

Dr. Lewis Lee Washburn, Benton, aged 60, died recently.

Continued on page 38

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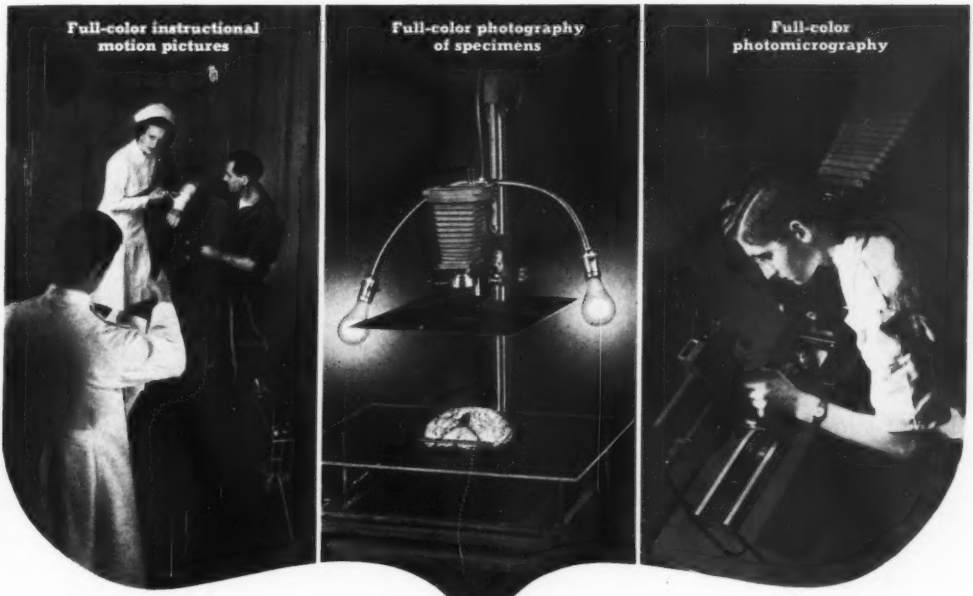

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LOUISIANA

Dr. Eugene H. Countiss, New Orleans, has been named Chief of the Emergency Medical Service in Louisiana.

Dr. Julius Wilson, New Orleans, has been elected Secretary of the Southern Trudeau Society.

Dr. Marion Winfred Hood (Ph.D.), formerly Associate in Medicine at the University of Illinois College of Medicine, Chicago, has been appointed Assistant Professor of Parasitology in the Department of Public Health at Louisiana State University School of Medicine, New Orleans.

Dr. Edgar W. Warren, Abbeville, Director of the Vermilion Parish Health Unit, has been appointed to a similar position in Jefferson Parish.

Dr. Bjarne Pearson, New Orleans, has been appointed Associate Professor of Pathology and Bacteriology at Tulane University of Louisiana School of Medicine, New Orleans.

Dr. Jacob Katzeff, formerly of Brooklyn, New York, has been appointed Health Officer of La Fourche and Assumption Parishes.

Deaths

Dr. Harry Edmond Downs, Alexandria, aged 71, died recently of hypertensive and arteriosclerotic heart disease.

Dr. David Arthur Lines, New Orleans, aged 82, died recently of hypertension and coronary disease.

Dr. John Franklin Mouton, Lafayette, aged 74, died recently.

MARYLAND

Maryland Department of Health has announced its regular series of chest clinics for the fall and winter of 1942 and 1943, which are conducted under the joint auspices of the State Health Department and the State Tuberculosis Association and are made possible through the sale of Christmas seals.

Dr. Victor F. Cullen, State Sanatorium, was elected President of the Southern Tuberculosis Conference which met in Memphis, Tennessee, October 5-7. The place for the next meeting was tentatively set as Atlanta, Georgia, but it was left to the discretion of the Executive Committee if and when there will be a conference meeting next year.

Dr. W. T. Longcope, Physician-in-Chief, Johns Hopkins Hospital, Baltimore, has been elected to the honorary fellowship of the Royal Society of Medicine.

Dr. Robert U. Patterson, Major General, U. S. Army, retired, formerly Surgeon General, has been appointed Dean of the University of Maryland School of Medicine and College of Physicians and Surgeons, and Superintendent of the University Hospital, Baltimore. He succeeds Dr. Hamilton Boyd Wylie, Baltimore, who has been Acting Dean since the retirement of Dr. James M. H. Rowland, Baltimore, in 1939. Dr. Patterson was Dean at the University of Oklahoma School of Medicine, Oklahoma City, until recently when he reached the retirement age.

Dr. Harold R. Bohlman, Baltimore, was chosen President-Elect of the Aero Medical Association of the United States at its annual meeting held recently in Philadelphia.

Dr. Charles W. O. Bunker, Captain, Commander of the Naval Medical School, Bethesda, was assigned to command the Naval Medical Center at Bethesda in September and was nominated for promotion to Rear Admiral, succeeding Rear Admiral Charles M. Oman, who will become Commanding Officer of the Naval Convalescent Hospital at Harriman, New York.

Deaths

Dr. Luigi Dominick Di Stefano, Baltimore, aged 53, died recently.

Dr. Frank Oldham Miller, Ellicott City, aged 64, died recently of arteriosclerosis and coronary thrombosis.

Dr. George LeRoy Wissig, Baltimore, aged 44, died recently of coronary thrombosis.

MISSISSIPPI

Dr. W. D. May has moved from Lauderdale County to Corinth and will be Director of both the Alcorn and Tishomingo County Health Departments.

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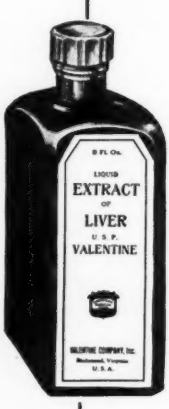

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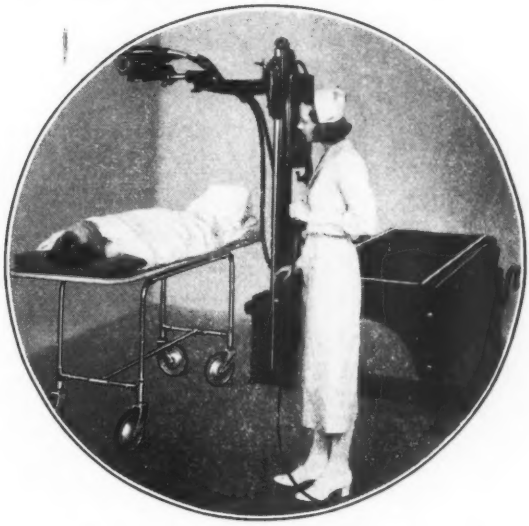

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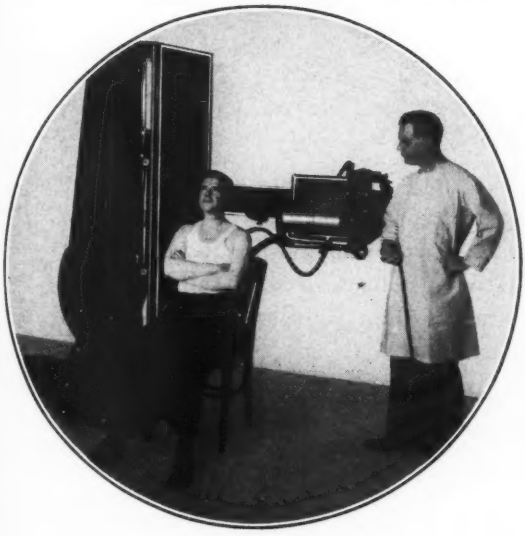

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Continued from page 38

Dr. Frederick Cooper Rehfeldt, Jackson, and Miss Ethel Evans Bennett, Fort Worth, Texas, were married recently.

Dr. Warren Matas Kirk, Louisville, and Miss Dorothy Kindelberger, Wheeling, West Virginia, were married recently.

Deaths

Dr. James Singleton Austin, Oak Ridge, aged 85, died recently.

Dr. John Green, Drew, aged 53, died recently.

Dr. William Jones Smothers, Cedar Bluff, aged 83, died recently.

Dr. Chester P. Thompson, Greenville, aged 63, died October 15 of myocarditis.

MISSOURI

The McMillan Hospital, St. Louis, one of the Washington University group of hospitals, has received a grant of $200,000 from the Federal Works Agency to provide an additional 160 hospital beds and to equip a large operating room.

A new Health Center is to be erected in Independence. The site was purchased by the City of Independence, and the cost of $48,000 for the building and equipment will be provided by the war public works section of the Federal Works Agency.

Dr. Howard B. Mettel, Chief of the Bureau of Maternal and Child Health of the Indiana State Board of Health and Acting Director of the Division of Services for Crippled Children in the State Department of Public Welfare, Indianapolis, is Director of the American Red Cross with headquarters in St. Louis.

Dr. Richard S. Weiss, St. Louis, President of the Missouri Social Hygiene Association, presided at the special public sessions on social hygiene in St. Louis recently, this meeting being sponsored by the American Social Hygiene Association and the Missouri Social Hygiene Association in connection with the 71st annual meeting of the American Public Health Association.

Dr. Sherwood Moore, St. Louis, was elected President-Elect of the American Roentgen Ray Society at its forty-third annual meeting held recently in Chicago.

Dr. Lawrence T. Post, St. Louis, has been elected President-Elect of the American Academy of Ophthalmology and Otolaryngology and will take office on January 1, 1944.

Division of Child Hygiene of the State Board of Health in cooperation with the Children's Bureau, Washington, D. C., is initiating a Medical and Hospital Obstetric and Pediatric Care program in Missouri for the families of the men in the armed forces, the program attempting to relieve medical problems occurring around the cantonment areas and problems that have arisen as a result of homes being upset, finances depleted and movement of families to new areas within the state.

Deaths

Dr. Edward James Hogan, Overland, aged 77, died recently of coronary occlusion.

Dr. C. V. Mosby, St. Louis, aged 67, died November 9.

Dr. Joseph W. Taylor, Huntsville, aged 87, died recently of carcinoma of the stomach.

Dr. Hugh Duncan McGaughey, Joplin, aged 61, died recently of coronary occlusion.

NORTH CAROLINA

Sixth District Medical Society has elected Dr. Verne S. Caviness, Raleigh, President; Dr. John Hunter, Cary, Vice-President; and Dr. Sidney Smith, Raleigh, Secretary-Treasurer.

Eighth District Medical Society has elected Dr. Robert L. McMillan, President; Dr. W. H. Sprunt, Vice-President; and Dr. George Harrell, all of Winston-Salem, Secretary.

Eastern North Carolina Sanatorium, which was opened recently at Wilson, makes the number of beds in sanatoria throughout the state, exclusive of Oteen and private sanatoria, 2,485: for white patients 1,429, and for Negroes, 1,056. Dr. Paul P. McCain is General Superintendent and Dr. Herman F. Easom is Associate Superintendent and Medical Adviser of the new sanatorium.

Continued on page 42

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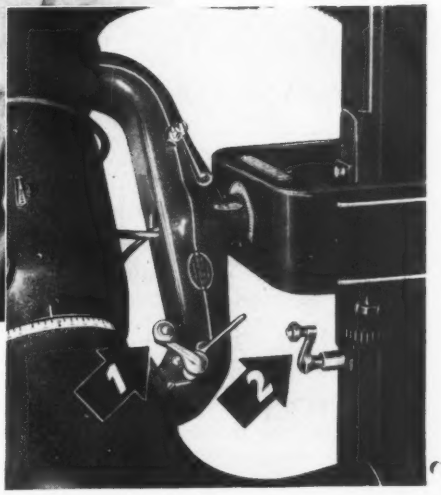

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Continued from page 40

Dr. O. D. Baxter, Charlotte, is serving as Radiologist in Asheville at the direction of the Procurement and Assignment Service during the absence of Dr. Donald MacRae and Dr. G. W. Murphy, who have been called into Army service. Dr. Murphy resigned as President of the Buncombe County Medical Society.

Dr. Lucy Morgan, U. S. Public Health Service, has been assigned to carry on public health education work in the State of North Carolina for the duration. She is cooperating with the School of Public Health of the University of North Carolina, and extensive additions are being made to the work offered in health education.

Dr. H. C. Coburn, Jr., Brigadier-General, Post Surgeon at Fort Bragg, was host to the fifth District Medical Society at its fall meeting.

Dr. C. L. Haywood, Jr., Elkin, has been named Consulting Surgeon of the Ashe County Memorial Hospital at Jefferson, succeeding Dr. Fred C. Hubbard, North Wilkesboro, who joined the Army Medical Corps.

A state highway marker was recently unveiled in honor of the late Dr. Solomon S. Satchwell, founder of the Medical Society of the State of North Carolina, and the first president of the State Board of Health.

The Committee on Merger, appointed by the North Carolina Medical Society, consisting of Dr. Hamilton W. McKay, Charlotte, Chairman, Dr. Paul P. McCain, Sanatorium, and Dr. Julian Moore, Asheville, met recently with representatives of Hospital Care, Hospital Saving and Medical Service Associations for the purpose of bringing about a merger between the three.

Dr. Joseph Allison Cannon, Wadsworth, and Miss Martha T. Buchanan, both of Durham, were married recently.

Dr. Roscoe Legrand Wall, Jr., Winston-Salem, and Miss Florence Emma Delaney, were married recently.

Deaths

Dr. Leon Edgar Norfleet, Tarboro, aged 78, died recently of cerebral hemorrhage.

Dr. Joseph Pawell Wimberley, Halifax, aged 65, died recently of arteriosclerotic heart disease.

OKLAHOMA

Third Annual Secretaries Conference of the Oklahoma State Medical Association was held in Oklahoma City, October 25, with Dr. George K. Hemphill, Pawhuska, Chairman; Dr. John R. Callaway, Pauls Valley, Vice-Chairman; and Dr. William E. Eastland, Secretary-Treasurer. Dr. Eastland replaced Dr. W. W. Rucks, Jr., Oklahoma City, who is in active military duty.

Muskogee, Sequoyah, Wagoner County Medical Society at a recent special called meeting elevated Dr. L. S. McAlister, Muskogee, to President, replacing Dr. Shade D. Neely, Muskogee, who is in the Navy and has reported for duty at Santa Ana, California. Dr. H. A. Scott, Muskogee, was elected Vice-President; and Dr. D. Evelyn Miller, Muskogee, Secretary-Treasurer, to fill the unexpired term of Dr. J. T. McInnis, Muskogee, who is in the Medical Corps, U. S. Army, at Camp Robinson, Arkansas.

Dr. W. W. Rucks, Sr., Oklahoma City, has been appointed by the Council of the Oklahoma State Medical Association to replace Dr. Henry H. Turner, Oklahoma City, who recently resigned as State Chairman of the Procurement and Assignment Committee.

Dr. Finis W. Ewing, Muskogee, immediate Past President of the Oklahoma State Medical Association, has been selected by the Council of the Association to replace Dr. Shade D. Neely, Muskogee, as Councilor of District No. 8.

Dr. Philip C. Risser has returned to Blackwell after having served in the U. S. Navy and is associated in practice with his father, Dr. A. S. Risser.

Dr. Samuel A. Corson, formerly of the University of Texas Faculty of Medicine, Galveston, has been appointed Assistant Professor of Physiology at the University of Oklahoma School of Medicine, Oklahoma City.

Dr. James A. Willie has opened a new hospital in Oklahoma City in which he will carry on his regular practice of diagnosis, study and treatment of all types of neurological and psychiatric cases.

Dr. Isadore Dyer, Tahlequah, Lieutenant, Medical Corps, formerly in charge of District 1, State Health Department, is now located at Hill Field, Ogden, Utah. He has been assigned

Continued on page 44

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Continued from page 42

as Group Surgeon, Headquarters and Headquarters Squadron for the 30th Air Depot Group.

Dr. Walter A. Howard, Chelsea, Major, Medical Corps, U. S. Army, is stationed at Will Rogers Field, Oklahoma City.

Dr. Don W. Branham, Oklahoma City, Lieutenant Commander, U. S. Navy, has been detached from the San Diego Naval Hospital to the U. S. Naval Hospital at Seattle, Washington, and is in charge of the Urology Department.

Dr. Hervey A. Foerster, Major, Medical Corps, U. S. Army, formerly of Oklahoma City, is Venereal Disease Control Officer at the Station Hospital, Camp Maxey, Paris, Texas.

Dr. E. W. Hawkins, Carnegie, was elected Senior Vice-Commander of the Eighth Army Corps Veterans National Association at a recent meeting in conjunction with the 44th National Encampment of the United Spanish War Veterans in Cleveland, Ohio.

Dr. Glenn S. Kreger, Lieutenant, Medical Corps, U. S. Army, formerly of Tonkawa, is on active duty at Fort Bliss, Texas, where he is Battalion Surgeon.

Dr. Edward D. McKay, Oklahoma City, has been commissioned Captain and has reported to active duty at Fort Sam Houston, San Antonio, Texas.

Dr. M. M. Appleton, Oklahoma City, Captain, Medical Corps, U. S. Army, a former reserve officer, has been assigned to duty at the William Beaumont Hospital, El Paso, Texas.

Dr. Lee R. Wilhite, formerly of Perkins, Colonel, Medical Corps, U. S. Army, is now in the 134th Medical Regiment at Fort Bragg, North Carolina. Before his transfer the first of August he was a representative of the Surgeon General's Office in charge of the Medical Recruiting Board of Oklahoma.

Dr. L. S. Morgan, Ponca City, Captain, Medical Corps, U. S. Army, has been assigned to the Air Corps and reported for service at the Arrow Air Base, Santa Ana, California.

Dr. Laile G. Neal, Ponca City, Captain, Medical Corps, U. S. Army, has been assigned to Fort Sam Houston, San Antonio, Texas.

Dr. Clifford B Cole, Norman, and Miss Janice L. Baeghler, Yuma, Arizona, were married recently.

Deaths

Dr. Wilson Davis Baird, Jr., Oklahoma City, aged 40, died recently of pneumonia.

Dr. Martin Johnson Bartlett, Oklahoma City, aged 71, died recently of heart disease.

Dr. J. M. Denby, Carter, aged 65, died recently.

Dr. Thomas Tilden Norris, Krebs, aged 66, died recently.

Dr. Charles Clarence Rose, Oklahoma City, aged 52, died recently of coronary thrombosis.

SOUTH CAROLINA

Dr. Robert Walton, formerly a member of the faculty of the University of Mississippi School of Medicine, University, Mississippi, has been appointed Professor of Pharmacy at the Medical College of the State of South Carolina, Charleston, to succeed the late Dr. W. H. Zeigler.

Dr. John Arthur Siegling, who has been in charge of the Department of Bone and Joint Surgery at the Carle Clinic at Urbana, Illinois, has returned to Charleston to practice and will be on the faculty of the Medical College of the State of South Carolina.

Dr. L. T. Belkin, formerly of the Yale University School of Medicine, New Haven, Connecticut, has been appointed Instructor in the School of Pharmacy at the Medical College of the State of South Carolina.

Dr. D. S. Pope and Dr. L. Emmett Madden, Columbia, attended the refresher course conducted under the auspices of the New York Academy of Medicine in October.

Dr. J. W. Varner, Columbia, has been doing some postgraduate work in Richmond, Virginia.

Dr Carl A. Sweatman, Columbia, has been at Stanford University School of Medicine, San Francisco, California, for a period of instruction in surgery.

Dr. C. P. Corn, Greenville, has been studying at the New York Postgraduate Skin Clinic in New York.

Dr. John D. McBrearty, Greenville, and Miss Sarah Louise Hepborn, Florence, were married recently.

Dr. W. H. Powe, Greenville, has completed a course in electrocardiograms at New York City.

Dr. Prentiss McLeod Kinney and Miss Mary Adelaide Smith, both of Bennettsville, were married recently.

Dr George Robert Dawson, Jr., Charleston, and Miss Ada Frances Gilchrist, Rock Hill, were married recently.

Dr. Lawrence P. Thackston, Orangeburg, Major, Medical Corps, U. S. Army, is Chief of the Surgical Service with the 92nd General Hospital, Camp Bowie, Texas; and Dr. Hugh Smith, Greenville, Major, Medical Corps, U. S. Army, is Chief of the Medical Service.

Dr. Rhett G. Harris, Instructor in Bacteriology at the Medical College of the State of South Carolina, Charleston, resigned to join the armed forces as 1st Lieutenant in the Sanitary Corps and is now stationed at Jefferson Barracks, Missouri. He has been replaced at the College by Dr. Raymond M. Young.

Dr. James T. Quattlebaum, formerly of Columbia, has been commissioned Captain in the U. S. Army Air Corps and ordered to duty at Miami, Florida.

Dr. H. G. Waddell, Columbia, is now a Colonel in active military service.

Dr. W. W. Edwards, Greenville, Captain, Medical Corps, U. S. Army, serving with the armed forces in Australia, has been promoted to the rank of Major.

Dr. Hugh Smith, formerly of Greenville and recently of Fort Jackson, is now stationed at 92nd General Hospital, Camp Bowie, Texas.

Dr. J. Kilgo Webb, Great Falls, has joined the armed forces and is serving at Camp Pickett, Virginia.

TENNESSEE

East Tennessee Medical Association has postponed its meeting for the present year and possibly for the duration.

Middle Tennessee Medical Association met in Gallatin in November. Dr. Beverly Douglas, Nashville, is Secretary.

Dr. N. B. Morris, Nashville, announces the opening of his office at 610 Doctors Building, practice limited to eye, ear, nose and throat.

Continued on page 46

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Continued from page 44

Western Surgical Association will meet at Memphis, December 4-5.

Dr. F. L. Alloway, Kingsport, Lieutenant Colonel, Medical Corps, U. S. Army, is at Camp Butner, Durham, North Carolina.

Dr. Madison S. Trewhitt, Cleveland, Lieutenant, Medical Corps, U. S. Army, is at Station Hospital, Camp Shelby, Mississippi.

Dr. George W. Jackson, Jr., Western State Hospital, Bolivar, Lieutenant, Medical Corps, U. S. Army, is at Station Hospital, Camp Blanding, Florida.

Dr. Douglas Chamberlain, Chattanooga, Captain, Medical Corps, U. S. Army, is at Station Hospital, Fort Benning, Georgia.

Dr. C. H. Barnwell, Chattanooga, Major, Medical Corps, U. S. Army, is at O'Reilly General Hospital, Springfield, Missouri.

Dr. Claude H. Taylor, Cleveland, is at Station Hospital, Fort Benning, Georgia.

Dr. John L. Montgomery, formerly of Knoxville, is at Station Hospital, Sheppard Field, Texas.

Dr. Wallace L. Poole, formerly of Johnson City, is in the U. S. Navy at Norfolk, Virginia.

Dr. R. W. Polk, Memphis, is at the 72nd Station Hospital, Fort Riley, Kansas.

Dr. W. C. Ruble, Jr., formerly of Newport, is at Camp Rucker, Alabama.

Dr. James Odell Fields and Miss Cecille Marie Williams, both of Milan, were married recently.

DEATHS

Dr. Horton Casparis, Nashville, aged 51, died November 12 of a heart attack while attending the Southern Medical Association meeting in Richmond, Virginia. Dr. Casparis was a member of the Council of the Southern Medical Association, a past Chairman of the Section on Pediatrics of the Association, and Professor of Pediatrics at Vanderbilt University School of Medicine.

Dr. Horace Wilbert Brown, Chattanooga, aged 78, died recently of cerebral hemorrhage and arteriosclerosis.

Dr. Walter Scott Dotson, Jr., Westmoreland, aged 35, died recently.

Dr. William Delpuech, Knoxville, aged 84, died recently.

Dr. Joseph Pilmoor Gilbert, Nashville, aged 48, died recently of heart disease.

Dr. William Johnson Matthews, Johnson City, aged 75, died recently of coronary thrombosis.

Dr. Robert Lee Murph, Dyersburg, aged 73, died recently of pellagra.

Dr. Spencer Boyd McClary, Sr., Etowah, aged 60, died recently.

Dr. George N. Springer, Hohenwald, aged 74, died recently of bronchopneumonia.

TEXAS

Texas Hospital Association will hold its next meeting at Fort Worth, February 18-19, 1943.

The Texas State Cancer Hospital and Research Laboratories will have as temporary quarters the six-acre estate of the late Captain James A. Baker which was recently purchased by the M. D. Anderson Foundation, Houston. The property will be donated to the University of Texas School of Medicine as temporary quarters for the Hospital and Laboratories until a permanent plant can be built. The State Legislature appropriated $500,000 for the project and the Anderson Foundation agreed to donate a site and to give $500,000 in addition. It is planned to build a medical center around the cancer hospital, including tuberculosis hospital, children's hospital, crippled children's clinic, and other units.

Hillcrest Memorial Hospital Staff, Waco, has elected Dr. C. H. Brooks, President; Dr. Paul C. Murphy, Vice-President; and Dr. Boyd D. Alexander, Secretary.

Wichita Health Unit Building has been completed at a cost, including furnishings, of $35,000 and is a twenty-room structure. It is occupied by the Health Unit and its associated agencies.

San Antonio Health Center, San Antonio, which will house all the health facilities of the city except venereal disease clinics, is being planned. A Federal grant of $140,000, $80,000 for the building and $60,000 for the equipment, will be used to purchase and equip the eight story old Alamo National Bank Building for this public health center.

University of Texas has appointed Dr. Chauncey Leake Executive Vice-President and Dean of the Medical Branch at Galveston, succeeding Dr. John W. Spies. Dr. Leake was formerly Pharmacologist of the University of California Medical School.

Dr. J. Edward Johnson, Mineral Wells, is the recipient of a Trudeau Scholarship for 1942 from the National Tuberculosis

Continued on page 48

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R. B. H. Gradwohl, M.D., Sc.D., Director

Continued from page 46

Association and has been studying at the Trudeau Sanatorium, the course consisting of four weeks instruction there and a final two weeks at the Bellevue Hospital, New York City.

Dr. Willard R. Cooke, Galveston, was chosen President-Elect of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at its annual meeting.

Dr. Carl M. Austin, Dallas, and Miss Lu Eva Sullivan, Mangum, Oklahoma, were married recently.

Dr. Shirlev S. Bowen, Houston, and Miss Dorothea Springer were married recently.

Deaths

Dr. Charles H. Bishop, Wichita Falls, aged 36, died recently of coronary thrombosis.

Dr. William Carroll Barnett, Big Spring, aged 70, died recently.

Dr. William Robert Bennett, San Antonio, aged 69, died October 15.

Dr. Samuel Claude Harrell, Jr., Monahans, aged 39, died recently of injuries received in an automobile accident.

Dr. Wilbur Samuel Hamilton, San Antonio, aged 70, died recently.

Dr. Neal Davidson Monger, San Benito, aged 44, died recently of cardiovascular renal disease.

Dr. John William Moore, Dialville, aged 71, died recently of uremia and a fractured hip received in a fall.

Dr. Charles Daniel Price, Whitesboro, aged 64, died recently of pneumonia.

Dr. Sam J. Petty, Decatur, aged 66, died recently.

Dr. Alphonse L. Shackelford, Dallas, aged 74, died recently of coronary occlusion.

Dr. Eugene E. Woodruff, Cooper, aged 69, died recently of heart disease.

VIRGINIA

Medical Society of Virginia at its annual meeting held in Roanoke in October, installed Dr. J. M. Emmett, Clifton Forge, President; and elected Dr. C. B. Bowyer, Stonega, President-Elect; Dr. W. L. Powell, Roanoke, Dr W. R. Payne, Newport News, and Dr. P. W. Boyd, Winchester, Vice-Presidents; Dr. M. Pierce Rucker, Richmond, Editor, and Miss Agnes Edwards, Secretary-Treasurer.

Tazewell County Medical Society has elected Dr. M. B. Crockett, Tazewell, President; Dr. Lee Harris, Richmond, Vice-President, and Dr. Mary E. Johnston, Tazewell, Secretary-Treasurer.

Southwestern Virginia Medical Society has elected Dr. James P. King, Radford, President; Dr. A. B. Graybeal, Marion, Vice-President; and Dr. G. C. Williams, Pearisburg, Secretary-Treasurer.

Virginia Obstetrical and Gynecological Society has elected Dr. H. C. Spalding, President; Dr. A. L. Carson, Jr., Vice-President, and Dr. W. C. Winn, Secretary-Treasurer, all of Richmond.

Virginia Orthopedic Society has elected Dr. J. B. Dalton, Richmond, President; and Dr. J. T. Tucker, Richmond, Secretary-Treasurer.

Virginia Pediatric Society has elected Dr. J. S. Weitzel, Richmond, President; Dr. E. A. Harper, Lynchburg, Vice-President, and Dr. Emily Gardner, Richmond, Secretary-Treasurer.

Virginia Radiological Society has elected Dr. Wright Clarkson, Petersburg, President; Dr. Clayton Eley, Norfolk, Vice-President, and Dr. C. M. Peterson, Roanoke, Secretary-Treasurer.

Virginia Urological Society has elected Dr. B. E. Harrell, Norfolk, President; Dr. T. B. Washington, Richmond, Vice-President, and Dr. Warren W. Koontz, Lynchburg, Secretary-Treasurer, reelected.

Dr. Wyndham B. Blanton, Richmond, has retired as Editor of the Virginia Medical Monthly and is succeeded by Dr. M. Pierce Rucker, Richmond.

Dr. Nelson Mercer, formerly of Richmond but recently of Philadelphia, Pennsylvania, has moved to Martinsville where he will be on duty at the Nylon Division Plant of the E. I. duPont Company.

Dr. J. E. Haynsworth, recently of Clifton Forge, is now associated with Dr. Elisha Barksdale in the Allied Arts Building, Lynchburg.

Continued on page 50

AND SMALL WONDER . . . with so many colleagues out of civilian practice, the pace grows terrific. Ever-jangling telephone . . . calls piling on calls . . . sleep snatched when you can . . . and meals hastily eaten or missed.

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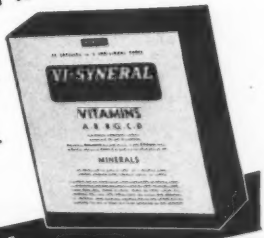

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Continued from page 48

At the University of Virginia School of Medicine there will be held on December 8 and 9 the Postgraduate Clinic for Otolaryngology, and on December 10 and 11 the Postgraduate Clinic for Ophthalmology. Further information may be obtained from Dr. Fletcher D. Woodward, University Hospital, Charlottesville.

Gill Memorial Eye, Ear and Throat Hospital will hold its seventeenth annual Spring Graduate Course in Roanoke, April 5-10, 1943.

Dr. William F. Hatcher, formerly of Clifton Forge, has moved to Roanoke to take over the practice of Dr. Charles A. Young, who is now serving in the U. S. Army.

Medical College of Virginia, Richmond, has received a grant of $11,737.00 from the Federal Government for loans to students, and one of $250.00 from Van Pelt and Brown for research.

Medical College of Virginia faculty members who are completing the course given by the Federal government on decontamination and treatment of gas and fire casualties are: Dr. Harry Walker, Dr. Harvey B. Haag, Dr. Everett I. Evans, Dr. Arthur Klein, Dr. M. J. Hoover, Dr. J. C. Forbes and Dr. I. C. Riggin, all of Richmond.

Dr. R. B. Turnbull, formerly on the staff of the Blue Ridge Sanatorium, Charlottesville, is principal Medical Officer (Clinician) of the special Tuberculosis-Pneumonia Control Program sponsored by the Commonwealth Fund of New York and the State Health Department of Tennessee in connection with the Sumner Society Health Department with headquarters at Gallatin, Tennessee.

Dr. Donald K. Freedman, U. S. Public Health Service, is Assistant Health Officer of the Peninsular Health District with headquarters at Hampton.

Dr. John L. Lincoln, U. S. Public Health Service, recently at Hot Springs National Park, Arkansas, has been assigned to the Hampton Roads Defense Area, Newport News, as Area Venereal Disease Control Officer.

Dr. Walter B. Quisenberry, U. S. Public Health Service, recently at Hot Springs National Park, Arkansas, has been assigned to Camp Pickett Area, Farmville, as Area Venereal Disease Control Officer.

Dr. Randolph P. Grimm, U. S. Public Health Service, has been assigned to Hampton Roads Defense Area, Norfolk, as Area Venereal Disease Control Officer.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons at its fifty-fifth annual meeting held recently at Hot Springs, installed Dr. Willard R. Cooke, Galveston, Texas, President; Dr. Lewis F. Smead, Toledo, Ohio, President-Elect; Dr. James R. Bloss, Huntington, West Virginia, Secretary, re-elected; and Dr. Ward F. Seely, Detroit, Michigan, Treasurer. It was decided to discontinue spring clinical meetings of the association but to continue the annual meetings.

Deaths

Dr. John F. Armentrout, Roanoke, aged 75, died recently.

Dr. Robert Bagley Cralle, Jr., Farmville, aged 39, died recently.

Dr. Littleberry Stainback Foster, Williamsburg, aged 86, died recently.

Dr. Howard Marshall Smith, Richmond, aged 75, died recently of heart disease.

Dr. Edwin Willis Twyman, Twyman Mills, aged 89, died recently.

Dr. Henry Stevenson Wailes, Salisbury, aged 69, died recently.

Dr. Chastine G. Williams, Oak Grove, aged 70, died recently.

WEST VIRGINIA

Deaths

Dr. Posey G. Hurst, Oceana, aged 63, died recently of myocarditis and a fractured hip.

Dr. Wallace Dickenson Wayne, Fayetteville, aged 47, died October 8.

Dr. Amos De Russia Wood, Bluefield, aged 73, died recently of carcinoma of the stomach.

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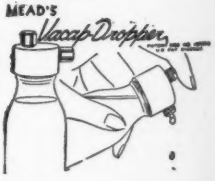

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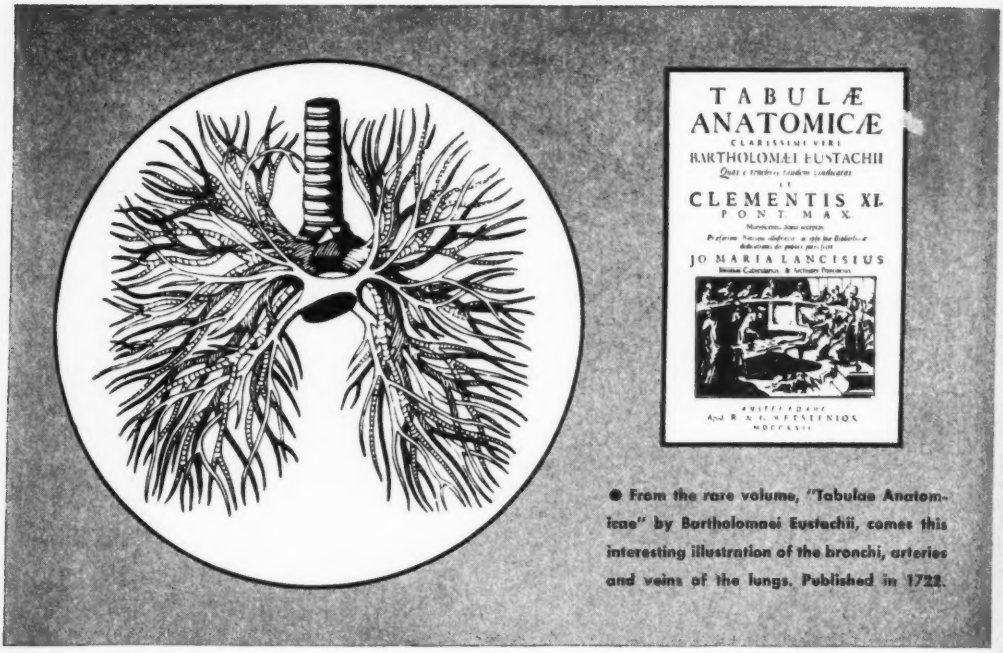

● From the rare volume, "Tabulae Anatomicae" by Bartholomaei Eustachii, comes this interesting illustration of the bronchi, arteries and veins of the lungs. Published in 1722.

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